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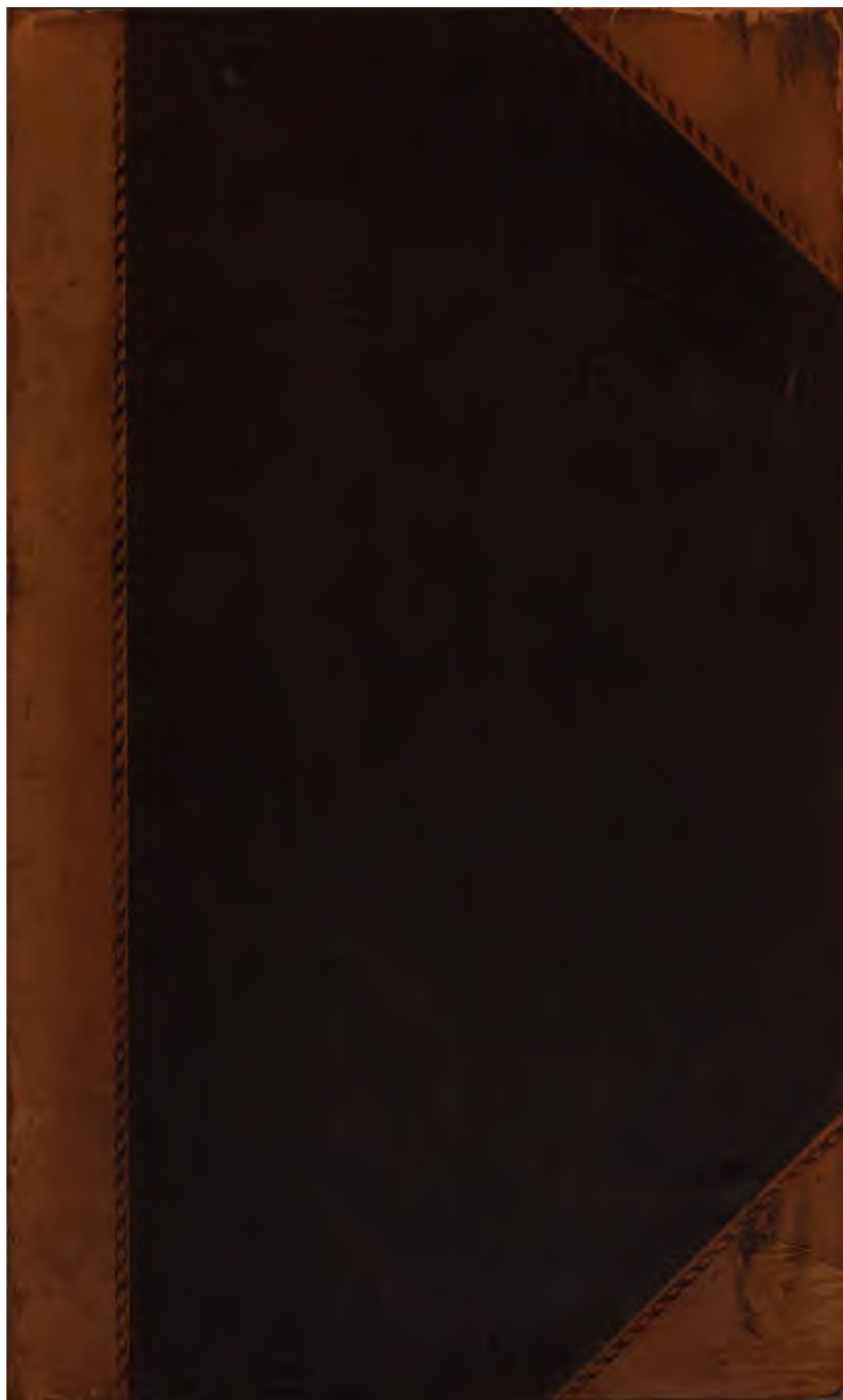
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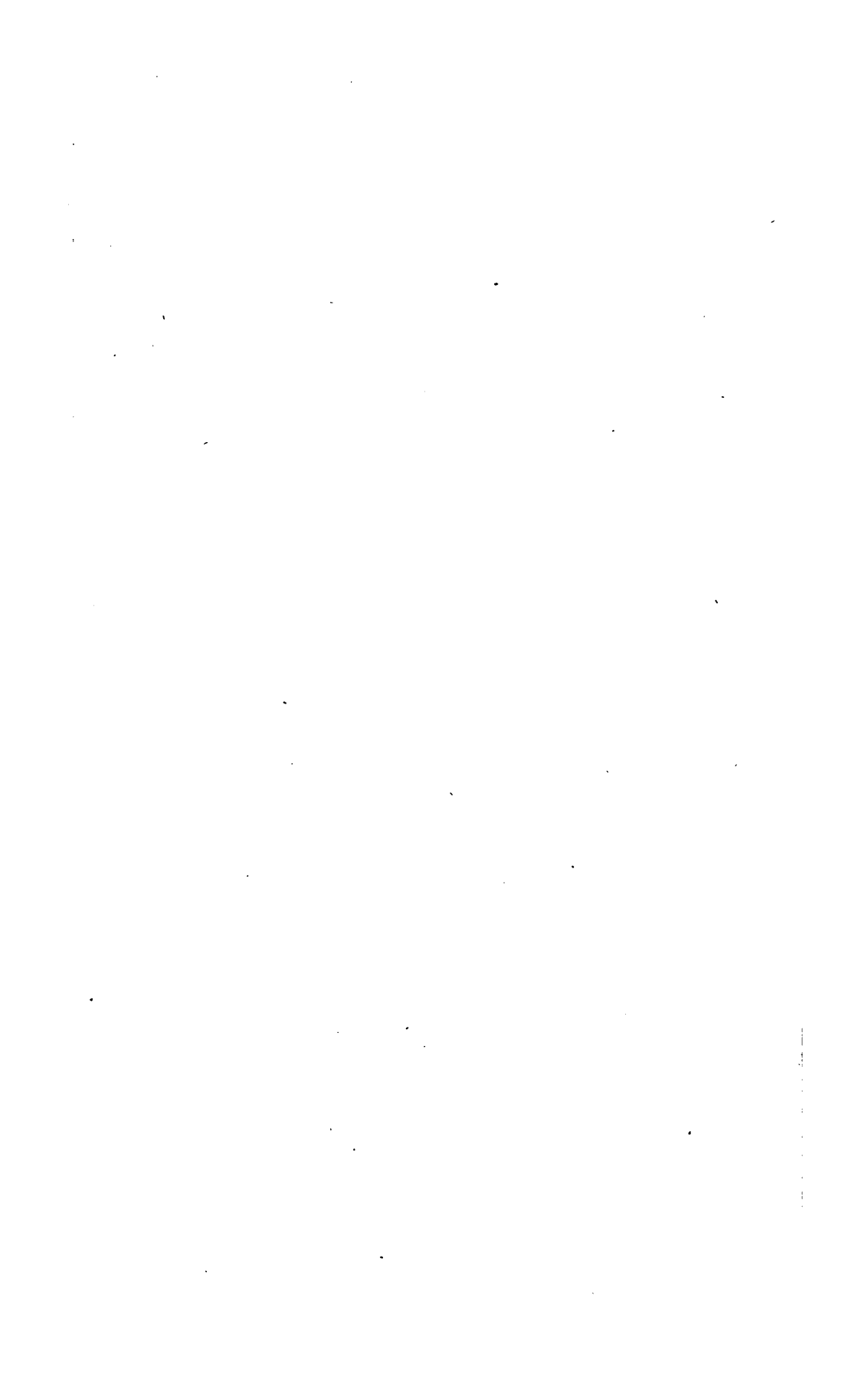
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THE
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A
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CONDUCTED BY
EDWARD NEWMAN, F.L.S., MEMB. IMP. L.-C. ACAD.

VOLUME THE TWELFTH.



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**" Her divine skill taught me *this*,
That from everything I saw
I could some instruction draw."**

G. WITHER.

**" The more I observe the more I find the necessity for observation ; and the less
I rely on what I have observed."—SAUSSURE.**

**" Verily, for mine own part, the more I looke into Nature's workes, the sooner
am I induced to believe of her, even those things that seem incredible."—
HOLLAND'S PLINY.**

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ADVERTISEMENT.

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THE ZOOLOGIST

FOR 1854.

Some further Remarks on the Habits of Bats.

By JONATHAN COUCH, Esq., F.L.S., &c.

As a preliminary to the continuance of my journal of the habits of bats in Cornwall (Zool. 3936), I beg to remark, in reply to a question of the Editor relative to the authenticity of the so-called specimen of *Vespertilio emarginatus*, that it closely resembled a drawing and description of one that was so denominated by a good authority, my friend W. S. Cocks, Esq., of Falmouth, and published in the first volume of a periodical named the 'Naturalist,' for November, 1851. Mr. Cocks's figure, and the specimen I examined, may well be called the "notch-eared bat," as this configuration is remarkable in them, and differs from this part in any other kind of bat with which I am acquainted.

1853.

June 5. One bat only seen after 9 o'clock, for a moment : weather calm and overcast.

June 6. Bats locally abundant, in three situations distant from each other ; but they are not widely dispersed : showers through the day ; overcast and threatening : wet in the evening. A coast-guard-man informs me that he has seen bats in flight at 12 o'clock at night.

July 1. A showery day. Bats plentiful at 10 o'clock at night : a coast-guard-man informs me he has seen them at 2 o'clock in the morning ; and consequently they have been on flight all night. I find them making much dirt by throwing down their excrements in the chancel of T— church ; although I cannot find how they are able to get into it, or to fly out. All they eat must be on the wing, in this and most if not all others of their retreats.

July 5. A damp and misty evening has not prevented the bats from appearing.

August 4. Two *Pipistrelle* bats found dead in T—— church; their wings spread $8\frac{1}{4}$ inches. On dissection, the back-bone and ribs were found crushed: I can only suppose that this was done by an owl; but how they can have escaped afterwards and entered the church, where no crevice appears, is hard to be understood.

Long-eared bat, a specimen found dead in the Methodist Meeting-house at Polperro; and on dissection, the vertebræ are found to be crushed, as in the other two bats. No owl can have done it in this chapel, and it is difficult to suppose that a bat can fly far after its vertebræ are crushed in such a manner. Neither can the injury have been inflicted by a cat, at least in T—— church. There was no external mark of injury in these bats.

August 24. A large bat, probably the larger horse-shoe species, flying in the hall and principal staircase at T——. Perhaps this entrance into the mansion, so early in autumn, has a connexion with the weather; which, after being fine for a week, has become gloomy, with wind, and ending in a boisterous succession of days.

August 30. A bat flying in the drawing-room at T——; to which place it had obtained access by passing through a dark and crooked passage: weather, heavy showers. I afterwards found, between the showers, a bat flying at near a quarter of a mile from any place where its resort could be.

There is in the church at T——, an iron helmet, fixed on a support at some distance from the wall, and at a lofty elevation. As some dung of bats was found on the floor under this place, a roll of flaming sulphur was held below this helmet, and thus seventeen of these creatures were expelled from this very limited place of confinement.

September 4. In the same church two of the long-eared species were found dead. On dissection, one was found to have its ribs crushed together, and the other was as greatly injured in the lumbar vertebræ.

September 5. At T—— a bat flew into the drawing-room, through a crooked side passage, when from the entrance of the house they might have chosen a wider and lighter space, by the side of which they passed without turning into it: they preferred the darker passage to a light one. There is a very narrow crevice over the wood-work of a window in this mansion; out of which I saw four bats take flight. They came through it easily, although it is exceedingly narrow. After a few minutes one of them returned from its flight, and did not

again show itself from the retreat. A gentleman informed me that a few days since he counted seventeen bats proceeding from this crevice.

September 9. A bat—Pipistrelle—caught in the drawing-room at T——. It was ready to bite when handled, and to utter stridulous sounds. Weight sixty grains.

September 10. A long-eared bat clasped inside against the wall of T—— church. Weight fifty-eight grains.

September 12. At the mansion of T—— bats abundant : outside, in the hall, drawing-room, gallery on the second floor, passages leading to bed-rooms on the third floor : weather fine. They were on flight early in the evening.

After an absence of three weeks :—

October 10. A bat flying in the drawing-room at T——, and many abroad.

October 13. Bats numerous, flying early : remarked for their dark colour ; and one had its wing slit.

October 14. Bats in flight.

October 17. Made an attempt, by introducing a slender rod, to compel the bats to come out from their retreat over the window at T——. Their resting-place was found to be at the distance of about a foot from the orifice ; but when irritated they retreated out of reach, with audible squeaking.

October 23. One or two bats, flying high. Evening damp and gloomy.

October 26. A bat of large size.

November 7. Numerous bats flying in a cove of the cliff, at the entrance of the harbour.

November 8. Bats in the same place, as early as half-past 4 o'clock.

In reference to the particular nature of the injury—a fracture and displacement of the vertebræ and ribs, found to exist in several specimens of bats, by which they had been killed—it may be interesting to record that such has also been the case with several specimens of the common shrew (all, in fact, which have been obtained in the course of one summer) that were found dead in the road or in gardens. Little or no mark was found externally, but a fatal injury has invariably been discovered in the spinal column and ribs ; inflicted, no doubt, by an owl, or by some animal that had found the little purblind creatures wandering about in the dark, and destroyed, without choosing to eat them. The water shrew (*Sorex fodiens*), is just as frequently found dead as the shrew mouse (*Sorex araneus*) ;

and the nature of the injury is a sufficient proof that the extensive mortality among these creatures towards the end of summer, so often remarked, is not, as some naturalists have imagined, the result of an epidemic disease, but the consequence of meeting some powerful enemy.

JONATHAN COUCH.

Polperro, November, 1853.

List of Birds exposed for Sale in the Market at Rome, in January, 1853. By PHILIP LUTLEY SCLATER, Esq., F.Z.S., &c.

BEING in Rome during the month of January of the present year, I was in the habit of paying a daily visit to the bird-market in the Piazza della Rotonda, to look over the contents of the stalls, and see if I could find anything differing from what one is accustomed to meet with in England. The Italians (as Mr. Waterton has remarked) eat feathered fowl of every description, valuing them principally in proportion to their magnitude. For the small birds, such as sparrows, &c., the common price is one *baiocco*, or one halfpenny English; for *tordi* (Turdi) 2*d.* or 3*d.* a-piece; for larger birds as much as a *paul* (5*d.*), and so on; and though the demand was great, the supply seemed always abundant.

I met with about a dozen species there that do not occur in England: January, of course, is one of the worst months in the year for considering Rome in an ornithological point of view, altogether rather a novel way of regarding it; during the spring my Italian friend told me that hoopoes, rollers, and all sorts of winged rarities were abundant. The present list, however, though small and imperfect, may perhaps be useful, as showing that the northern limit of some of the European summer migrants, such as *Sylvia melanocephala* and *atricapilla* and *Yunx torquilla* is passed at Rome. It may also possibly induce somebody staying longer than myself in the "eternal city," and at a more favourable time of year, to turn his attention to this subject, rather a neglected one at that place.

I know of no published work on the birds of the Roman States. Professor Savi's '*Ornitologia Toscana*' is, in fact, the only standard book on the Ornithology of this part of Italy. The Pisa Museum, under his superintendence, is one of the best south of the Alps, and

contains a most valuable and beautifully mounted collection of birds. Among other rarities, I saw there two fine examples of that scarce *pastor-like* bird the *Fregilupus varius* (Bodd.), from the Mauritius, of which, I believe, no specimen exists in the British Isles.

It has been often remarked, that one of the first things that strikes the observant traveller on the continent, is the great scarcity of birds. In no part of France, Germany, Switzerland, Italy, or Sicily, have I seen them in such abundance as in England. This arises, I fancy, in a great measure, from their being used as food in those countries to a much greater extent than we have any notion of in England. Indeed, the only birds I have well observed during four or five journeys on the continent which are not *more* common in England, are perhaps the Tithys redstart, which is very abundant in Baden and the upper Rhine provinces, and the Alpine swift, which breeds in numbers in the tower of the cathedral at Berne. But of course the chief obstruction to one's ornithological observations on the continent—even greater than the scarcity of objects—is the modern system of European travelling, rail and steam; stopping principally in *towns*, where one is hardly likely to meet with novelties in natural history.

The species marked with an asterisk have not been observed in the British Isles. The names are generally those of the British Museum Catalogue.

Falco peregrinus. One specimen was sold in the Roman market during my stay in Rome.

Tinnunculus alaudarius, *Accipiter Nisus*. Both common. I did not see the South European kestrel (*Tinnunculus cenchris*) myself, but I was informed that it might be occasionally found in the market on a Sunday morning, when the peasants come in from the campagna, and on which day the supply of birds is most abundant. The kestrel inhabits the city of Cremona, in Lombardy. I saw several when on the celebrated tower of Cremona, hovering over the city, where I suppose they feed on the insects and mice.

Milvus austriacus,* (*Gm.*) *G. B. Eur.* i. A common bird in the Campagna di Roma.

Turdus merula, *T. viscivorus*, *T. pilaris*, *T. iliacus*. *Tordi* are particularly appreciated by the Italians as by their progenitors. "*Obeso*

* The usually employed specific name *regalis* having only Brisson's authority (who was no binomialist), must, according to my ideas, give place to Gmelin's "*austriacus*."

nil melius turdo," says Horace in his 'Epistles,' and the Romans, I believe, agree with him to this day.

The *Passera solitaria* of the Italians (*Monticola cyanea*), identified by Mr. Waterton with the "sparrow that sitteth alone upon the housetop" of the Scriptures, is frequently to be seen in the Coliseum, where, sitting on the ruins, it displays its *ruticilline* affinities by the constant motion of its tail. I have not observed it exposed for sale in the market.

Pratincola rubicola.

Dandalus rubecula. A greater number of robins are sold in the market than of any other bird.

**Cisticola schœnicola*, (Bp.) Gould, B. E. ii. pl. 113.

**Cettia sericea*, (Bp.) Gould, B. E. ii. pl. 115.

Obtained each once.

**Calamodyta melanopogon*, Gould, B. E. ii. pl. 111. I am not aware that the presence of this bird in Europe in winter has been before noticed. I obtained but one specimen in the market. Professor Savi states that he is not aware that it has been noticed elsewhere than in Tuscany.

Calamoherpe arundinacea, (L.) i. e. *Sylvia turdoides*, auct., which ought to bear this name.

**Sylvia melanocephala* (Gm.), Gould, B. E. ii. pl. 123. Frequent.

Sylvia atricapilla. Males and females both very common. In summer I am told they mostly disappear.

Regulus auricapillus.

Motacilla alba.

Anthus arboreus. Very common.

Corydalla Richardi. One specimen of this rare pipit was purchased in the market during my stay in Rome, and presented to the Museum of the Collegio di Sapienza.

Anthus spinoletta, (L.)? I regret to say I did not bring home an Italian specimen of this bird, which I believe to be different from the English "shore pipit," *A. obscurus* of Gray's Catalogue, Gould, pl. 138.

Accentor modularis.

Troglodytes europæus. I preserved one specimen of a wren which I thought looked a little different from what I was in the habit of seeing in England. The shade of colour on the head and upper parts is certainly not quite the same as in English specimens, but I believe my Roman example to be not very mature.

Alauda cristata, *A. arvensis*, *A. arborea*.

**Melanocorypha calandra*, *Gould*, *B. E.* pl. 162.

All these species of larks are very common in the markets. I have seen the *M. calandra* in Sicily.

Parus major, *P. cæruleus*, *P. palustris*, *P. caudatus*. All common. The *Parus major* is a common cage-bird in Italy.

Emberiza miliaria, *E. cirrus*, *E. citrinella*, *E. cia*, *Gould*, *B. E.* pl. 179. The *E. miliaria* is sold with the larks. The *E. cirrus* and *citrinella* seem equally common. Of the *E. cia*, specimens are not unfrequent.

**Passer Italiæ* (*Vieill.*), *Gould*, *B. E.* The only sparrow I have seen in Italy, though at Milan I was told that the *P. domesticus*, which they called the *Passera Francese*, was sometimes to be met with in winter. It precisely resembles its North European congener in habits and manners.

**Petronia stulta* (*Strick.*), *Gould*, pl. 186. Tolerably common.

Carduelis elegans.

**Serinus brumalis*, *Gould*, pl. 195.

Linaria linota.

These three species are to be seen often, both dead and alive, for sale.

Coccothraustes europæus.

Chlorospiza chloris.

Pyrrhula ruticilla.

Sturnus vulgaris.

Garrulus glandarius.

Pica caudata.

Corvus monedula, *C. frugilegus*, *C. cornix*.

Gecinus viridis.

Picus major.

Yunx torquilla. My specimen appears to have a different tint and smaller bill than the ordinary *Yunx*. It is probably a bird of the year. The *Yunx* disappears from Rome in the summer, they tell me. In the month of January it was constantly to be seen suspended among other small birds brought in from the campagna.

Columba livia, *C. ænas*.

Caccabis rufa.

Perdix cinerea.

Phasianus torquatus. I only recollect seeing a pheasant exposed for sale once, and not a great many partridges. There appeared always a greater demand for the smaller species of birds.

Coturnix dactylisonans. Always a few. In spring and autumn they are said to be very abundant.

Charadrius pluvialis.

Vanellus cristatus.

Scolopax rusticola, *S. major*, *S. gallinago*, *S. gallinula*.

Numenius arquata.

Ardea cinerea.

Botaurus stellaris.

Ibis falcinellus. Two examples of this bird were observed in the market by a friend of mine last January. In spring and autumn it is by no means rare.

Rallus aquaticus.

Gallinula chloropus.

Fulica atra.

Anas boschas.

Mareca Penelope.

Querquedula crecca.

Fuligula cristata.

Anser segetum.

PHILIP LUTLEY SCLATER.

49, Pall Mall, November 16, 1853.

Occurrence of Black Redstarts near Penzance.—I observed this morning two beautiful specimens of this bird at Mr. Vingoe's, which he said he procured from a cliff-hedge adjoining the sea, at Marazion. They were male birds, and of course in winter plumage; the predominant colour of which was a sooty-black, with a strong tinge of iron-gray. I am inclined to think now that this is the winter plumage of adult males, the colour becoming more intense in the summer.—*Edward Hearle Rodd; Penzance, November 22, 1853.*

Occurrence of the Little Bustard near the Land's End.—A female bird, in excellent condition, of this interesting species was brought to me for my inspection about a fortnight since, and which had been brought in by a farmer from the Land's End district with some other birds; its value as a rare British bird was of course unknown, and it was only accidentally observed hanging in the lobby of one of our hotels with other game, and supposed to be "a sort of a mottled pheasant." Weight $1\frac{1}{2}$ lb. Previous to its capture we had a tremendous gale from the South, which, no doubt, drove the bird from the part of the continent where it is known to exist plentifully.—*Id.*

Occurrence of the Glossy Ibis near Shrewsbury.—A glossy ibis was shot at Allbrighton, four miles from this town, on the 3rd of October last; it was a male bird nearly in adult plumage. There were two of them together; they came to a small pool of

water for several mornings about nine o'clock to feed on small shell-fish, which I found in the stomach of the one shot. The man that shot it was ploughing in a field near; they were by no means wild; he told me he could have shot them before. I had it soon after it was shot, and sold it to a gentleman of this town who is making a collection of British birds; he saw it in the flesh.—*W. Franklin*; 18, *Mardol, Shrewsbury*, December 2, 1853.

Note on the Birds of Prey which attack trained Falcons.—It may perhaps interest the readers of the 'Zoologist' to know that the attacks of large birds of prey on trained falcons, which have already been referred to in that periodical (Zool. 3575, 3684, 4052), are not confined to the continent of Asia. Frank Vanderhevel, a celebrated Dutch falconer, who died about six years ago, at a very advanced age, told me that many years ago, while training a cast of gyr falcons at Valkenswaerd, in Brabant, an eagle made a stoop at one of them, and struck out some of its feathers; whereupon the falcon, which, it seems, escaped the full force of the blow, rose high in the air, and, flying away, was never seen again. This occurrence, though it took place so long ago, is well remembered by the falconers at Valkenswaerd; and I believe, although I am not certain, that the aggressor in this case was a golden eagle. I may add that peregrine falcons, both wild and trained, often exhibit signs of great alarm, and refuse their quarry, in the presence of the goshawk, and of the common and rough-legged buzzards.—*Edward Clough Newcome*; *Feltwell, Brandon*, December 20, 1853.

Occurrence of the Rough-legged Buzzard (Buteo lagopus) and Peregrine Falcon (Falco peregrinus) in Cambridgeshire.—I have lately been fortunate in obtaining a fine specimen of the rough-legged buzzard, which was shot near the borders of Norfolk, and was brought to me when just killed. Also a fine specimen of a female peregrine, which was shot a few miles from Cambridge, and was brought in alive, but was too much injured to live. Both the birds were procured for me by Mr. John Baker, of this town, who is mounting them. The mate of the buzzard was seen at the same time, but has not yet been procured.—*Alfred F. Sealy*; 71, *Trumpington St., Cambridge*, December, 1853.

Occurrence of various Birds in Oxfordshire.—A very fine specimen of the ash-coloured shrike (*Lanius excubitor*) was killed near Gassington, in Oxfordshire, about the end of last month, and is now in my possession. A specimen of Richardson's skua (*Lestris Richardsonii*), in the plumage of the second year, as described in Yarrell's 'British Birds,' was shot at Ickford, in Oxfordshire, about the middle of September last. A fine specimen of the great or solitary snipe (*Scolopax major*) was also shot at the same time and place as the above.—*T. L. Powys*; *Lilford Hall, Northamptonshire*, December 11, 1853.

Note on the late abundance of the Spotted Crake (Crex porzana).—None of your correspondents seem to have noticed the unusual abundance of the spotted crake in different parts of the country this autumn. Several, I should think six or seven, were in the Oxford markets in September and October. During two days' snipe-shooting at Whittlesea about the middle of October, I saw eight and shot six, and our dog caught another. And from a friend living in Kent, I have heard that they have been very abundant in the marshes of that county also.—*Id.*

Occurrence of the Great Northern Diver in Wilts.—This noble bird, so essentially a denizen of the sea, has just made its appearance in adult plumage in the very middle of this inland county: it was first observed swimming majestically to and fro on a pond at Spy Park, the residence of Mrs. Starkey (just as I have seen it do in the

"fjords" of Norway): it subsequently strayed away into a narrow ditch, where it was captured by an old woman in the parish of Bromham, and for some short time was kept alive with bread and milk. When dead it was admirably mounted by Mr. Withers, Taxidermist, at Devizes, and is now in the possession of Captain Meredith. — *Alfred Charles Smith; Yatesbury Rectory, November 21, 1853.*

Occurrence of the Red-crested Whistling Duck at Boston. — Mr. Green, the Bird and Animal Preserver, of East Road, City Road, has this day brought me in the flesh an extremely fine male specimen of the very rare red-crested whistling duck, shot at Boston, in Lincolnshire. — *Edward Newman.*

A List of the Birds of West Cumberland. By Mr. JOSEPH ROBSON.*

- White-tailed Eagle, *Falco albicilla*. St. Bees Heads, occasionally.
 Peregrine Falcon, *Falco peregrinus*. St. Bees Heads, breeds.
 Hobby, *Falco subbuteo*. Lake district.
 Merlin, *Falco Æsalon*. Lake district, common.
 Kestrel or Windhover, *Falco Tinnunculus*. St. Bees Heads, breeds.
 Sparrow-hawk, *Falco Nisus*. St. Bees Head, common.
 Kite, *Falco Milvus*. Keswick.
 Swallow-tailed Kite, *Elanus furcatus*. A specimen of this extremely rare bird was shot in Eskdale in the spring of this year (1853), and is in the possession of an amateur animal-preserver at Whitehaven.
 Common Buzzard, *Falco Buteo*. Common.
 Honey Buzzard, *Falco apivorous*. Occasionally seen on mountains.
 Marsh Harrier, *Falco æruginosus*. Common.
 Short-eared Owl, *Strix brachyotus*. River Derwent.
 Barn Owl, *Strix flammea*. Very common.
 Tawny Owl, *Strix stridula*. Very common.
 Great Gray Shrike, *Lanius excubitor*. Westward.
 Red-backed Shrike, *Lanius Collurio*. Westward.
 Spotted Flycatcher, *Muscicapa grisola*. Common.
 Pied Flycatcher, *Muscicapa atricapilla*. Common.
 Common Dipper, *Sturnus Cinclus*. In all rivers.
 Missel Thrush, *Turdus viscivorus*. Hensingham, common, breeds.
 Fieldfare, *Turdus pilaris*. Common.
 Song Thrush, *Turdus musicus*. Common.

* Communicated by Walter Buchanan, Esq., F.L.S., &c.

- Redwing, *Turdus Iliacus*. Common.
 Blackbird, *Turdus Merula*. Common.
 Ring Ousel, *Turdus torquatus*. Irton.
 Alpine Accentor, *Accentor alpinus*. Cold Fell, &c.
 Hedge Accentor, *Sylvia modularis*. Very common.
 Redbreast, *Sylvia rubecula*. Very common.
 Redstart, *Sylvia phœnicurus*. Santon Bridge.
 Stonechat, *Sylvia rubicola*. Common.
 Whinchat, *Sylvia rubetra*. Common.
 Wheatear, *Sylvia Cenanthe*. Common, frequenting the highest mountains.
 Grasshopper Warbler, *Sylvia locustella*. St. Bees Valley.
 Sedge Warbler, *Sylvia salicaria*. St. Bees Valley.
 Garden Warbler, *Sylvia hortensis*. St. Bees Valley.
 Common Whitethroat, *Sylvia cinerea*. St. Bees Valley.
 Lesser Whitethroat, *Sylvia sylviella*. St. Bees Valley.
 Wood Warbler, *Sylvia sylvicola*. St. Bees Valley.
 Willow Warbler, *Sylvia Trochilus*. St. Bees Valley.
 Chiff-chaff, *Sylvia Hippolais*. St. Bees Valley.
 Golden-crested Wren, *Sylvia Regulus*. St. Bees Valley and Irton woods.
 Greater Tit, *Parus major*. In the neighbourhood of Gosforth.
 Blue Tit, *Parus cæruleus*. Ditto.
 Crested Tit, *Parus cristatus*. Ditto.
 Cole Tit, *Parus ater*. Ditto.
 Marsh Tit, *Parus palustris*. Ditto.
 Long-tailed Tit, *Parus caudatus*. Ditto.
 Bohemian Waxwing, *Ampelis garrulus*. Shot near Santon Bridge.
 Pied Wagtail, *Motacilla alba*. Common.
 Gray Wagtail, *Motacilla Boarula*. Common.
 Yellow Wagtail, *Motacilla flava*. Common.
 Meadow Pipit, *Alauda pratensis*. St. Bees Valley.
 Rock Pipit, *Alauda obscura*. St. Bees Heads.
 Shorelark, *Alauda alpestris*. St. Bees Heads.
 Skylark, *Alauda arvensis*. Common.
 Snow Bunting, *Emberiza nivalis*. St. Bees shore.
 Common Bunting, *Emberiza miliaria*. St. Bees.
 Black-headed Bunting, *Emberiza Schœniculus*. St. Bees.
 Yellow-headed Bunting, *Emberiza citrinella*. St. Bees.
 Chaffinch, *Fringilla Cœlebs*. Common.
 Mountain Finch, *Fringilla montifringilla*. Cold Fell, &c.

- House Sparrow, *Fringilla domestica*. Common.
 Greenfinch, *Loxia Chloris*. Common.
 Hawfinch, *Loxia coccothraustes*. Common.
 Goldfinch, *Fringilla carduelis*. Common.
 Siskin, *Fringilla spinus*. Near Wigton.
 Common Linnet, *Fringilla Linota*. Common.
 Lesser Redpoll, *Linota linaria*. Waverton, near Wigton.
 Mountain Linnet, *Linota montium*. Common.
 Bullfinch, *Loxia Pyrrhula*. Common.
 Common Crossbill, *Loxia curvirostra*. Santon Bridge, occasionally.
 Common Starling, *Sturnus vulgaris*. Very common.
 Chough, Red-legged Crow, *Corvus graculus*. St. Bees Heads, occasionally.
 Raven, *Corvus corax*. St. Bees Heads, and all mountains.
 Carrion Crow, *Corvus corone*. St. Bees Heads.
 Rook, *Corvus frugilegus*. Common.
 Jackdaw, *Corvus Monedula*. Common.
 Magpie, *Corvus Pica*. Common.
 Jay, *Corvus glandarius*. Irton, &c.
 Nutcracker, *Corvus caryocatactes*. Near Whitehaven.
 Green Woodpecker, *Picus viridis*. Near Wigton.
 Great Spotted Woodpecker, *Picus major*. Near Wigton.
 Wryneck, *Yunx torquilla*. Near Wigton.
 Common Creeper, *Certhia familiaris*. Woods near Whitehaven.
 Wren, *Sylvia Troglodytes*. Common.
 Hoopoe, *Upupa Epops*. Shot at Loweswater, 1852.
 Nuthatch, *Sitta Europæa*. Wythop woods, Bassenthwaite.
 Cuckoo, *Cuculus canorus*. Common.
 Kingfisher, *Alcedo Ispida*. Ehen, and other rivers.
 Swallow, *Hirundo rustica*. Common.
 Martin, *Hirundo urbana*. Common.
 Sand-martin, *Hirundo riparia*. St. Bees Heads, &c.
 Swift, *Hirundo Apus*. Whitehaven, &c.
 Nightjar or Fern Owl, *Caprimulgus Europæus*. Mountains, not uncommon.
 Wood Pigeon, *Columba palumbus*. Common.
 Rock Dove, *Columba Livia*. Eagle Crag, Keswick.
 Turtle Dove, *Columba Turtur*. Carlisle.
 Pheasant, *Phasianus Colchicus*. Common.
 Black Grouse, *Tetrao Tetrix*. Ullswater, not uncommon.

- Red Grouse, *Tetrao Scoticus*. Common.
 Partridge, *Perdix cinerea*. Common.
 Quail, *Perdix Coturnix*. Near St. Bees, occasionally.
 Golden Plover, *Charadrius pluvialis*. Common.
 Dotterel, *Charadrius Morinellus*. Common.
 Ring Plover, *Charadrius hiaticula*. Common.
 Little Ring Plover, *Charadrius minor*. Common.
 Sanderling, *Charadrius calidris*. Common.
 Lapwing, Peewit, *Tringa Vanellus*. Common.
 Turnstone, *Tringa interpres*. Common.
 Green Sandpiper, *Tringa ochropus*. Common.
 Spotted Sandpiper, *Tringa macularia*. Common.
 Knot, *Tringa Islandica*. Moors.
 Little Stint, *Tringa pusilla*. Moors.
 Dunlin, *Tringa alpina*. Moors.
 Ruff, *Tringa pugnax*. Wampool, Wigton.
 Oyster-catcher, *Hematopus ostralegus*. Common, sea-coast.
 Common Heron, *Ardea cinerea*. Muncaster Heronry.
 Great White Heron, *Ardea alba*. Buttermere, J. Rook.
 Little Bittern, *Ardea minuta*. Buttermere.
 Common Bittern, *Ardea stellaris*. Near Workington, very rare.
 Curlew, *Numenius arquata*. Common, coast.
 Spotted Redshank, *Scolopax Totanus*. Abbey Holme.
 Common Redshank, *Scolopax calidris*. Abbey Holme.
 Greenshank, *Scolopax glottis*. Abbey Holme.
 Black-tailed Godwit, *Scolopax Lapponica*. Abbey Holme.
 Bar-tailed Godwit, *Scolopax ægocephala*. Abbey Holme.
 Woodcock, *Scolopax rusticola*. Common.
 Great Snipe, *Scolopax major*. Common.
 Common Snipe, *Scolopax Gallinago*. Common.
 Jack Snipe, *Scolopax Gallinula*. Common.
 Pigmy Curlew, *Scolopax pigmæus*. Moors.
 Landrail, *Gallinula Crex*. Common.
 Spotted Crane, *Gallinula Porzana*. Common.
 Little Crane, *Gallinula minuta*. Common.
 Moorhen, *Gallinula chloropus*. Common.
 Water-rail, *Rallus aquatica*. Common.
 Common Coot, *Fulica atra*. Bassenthwaite.
 Gray-legged Goose, *Anas Anser*, *Anas segetum*. Occasional visitor.
 Bernicle Goose, *Anas erythropus*. Coast, rare.

- Hooper Swan, *Anas Cygnus*. Ennerdale Lake, hard winters.
 Shieldrake, *Anas Tadorna*. Ravenglass, breeds.
 Pintail Duck, *Anas acuta*. Coast.
 Wild Duck, *Anas Boschas*. Rivers and lakes, breeds in Ennerdale.
 Teal, *Anas Crecca*. Tarns, breeds.
 Widgeon, *Anas Penelope*. Rivers, winter.
 Scaup Duck, *Anas Marila*. Coast.
 Tufted Duck, *Anas fuligula*. Coast.
 Long-tailed Duck, *Anas glacialis*. Coast.
 Golden-eye, *Anas clangula*. Coast.
 Smew, *Mergus albellus*. Coast.
 Goosander, *Mergus Merganser*. Ennerdale Lake, hard winters.
 Great Crested Grebe, *Podiceps cristatus*. Coast.
 Great Eared Grebe, *Podiceps auritus*. Coast.
 Little Eared Grebe, *Podiceps minor*. River Irt, &c. Called by country people the "Witch," from its rapid diving.
 Great Northern Diver, *Colymbus glacialis*. Coast.
 Black-throated Diver, *Colymbus arcticus*. Coast.
 Red-throated Diver, *Colymbus septentrionalis*. Coast.
 Guillemot, *Uria Troile*. Coast.
 Little Auk, *Alca alle*. Solway Firth.
 Puffin, *Alca arctica*. St. Bees Heads, breeds.
 Razorbill, *Alca Torda*. Solway Firth.
 Common Cormorant, *Pelicanus carbo*. St. Bees Heads.
 Green Cormorant, *Pelicanus gracilis*. St. Bees Heads.
 Sandwich Tern, *Sterna Boysii*. Coast, and North Mosses.
 Roseate Tern, *Sterna Dougalii*. Coast.
 Common Tern, *Sterna Hirundo*. Coast.
 Lesser Tern, *Sterna minuta*. Ravenglass, estuaries.
 Little Gull, *Larus minutus*. Common.
 Masked Gull, *Larus capistratus*. Common.
 Black-headed Gull, *Larus ridibundus*. Common.
 Kittiwake Gull, *Larus tridactylus*. Common.
 Common Gull, *Larus canus*. Common.
 Lesser Black-backed Gull, *Larus fuscus*. Common.
 Great Black-backed Gull, *Larus marinus*. Breeds on Devoek Water, remains all the year.

J. ROBSON.

Whitehaven, September, 1853.

Origin of the Opinion that there is some Virtue in the Tench, which renders it the Physician of Fishes.—Some correspondents of the 'Zoologist' have succeeded in showing that the healing virtues believed to reside in the tench (*Tinca vulgaris* of Cuvier), are founded in popular error; but it becomes a question, how an opinion so widely spread, and so generally adopted, even by eminent naturalists, should have started into existence, and have received such general countenance. Abundant as are the superstitions and follies collected together in the writings of very ancient naturalists, such as Pliny, and the Magi of Greece and Rome, this supposition concerning the tench is not to be found in them; and I strongly suspect that it has no better or more ancient support, than is afforded by the following passage, extracted from the 'Chronicle' of Hollinshead, who, when advancing the pretensions of this fish to be the leech of its fellow-inhabitants of the waters, goes on to give the following instance in proof of the fact:—"For when the fish-monger hath opened his—the pike's—side, and laid out his rivet unto the buier, for the better utterance of his ware, and cannot make him away at that present, he laieth the same againe into the proper place, and sowing up the wound, he restoreth him to the pond where tenches are, who never cease to sucke and licke his greeved place, till they have restored him in healthe, and made him readie to come againe to the stall when his turne shall come about." And so, this nibbling of the fat of a wound that would have healed as well without it, has given rise to an opinion which naturalists have been content to copy from each other to the present moment.—*Jonathan Couch; Polperro, December, 1853.*

Capture of the Three-spotted Wrasse (Labrus trimaculatus) in the Moray Firth.—On the 26th of October last, two specimens of that very rare British fish, *Labrus trimaculatus*, were caught on the small haddock-line by Donald Main, a very observant fisherman of Burghead. They at once struck his eye as something rare, and with much commendable zeal he brought them carefully ashore, and preserved them alike from the gridiron and the dunghill, in order that they might be identified, and their capture recorded. They were forwarded to me by the Rev. Alexander Leslie, of Burghead, who has since kindly ascertained the following particulars regarding these fish, which seem to be entire novelties to the fishermen of that part of the coast, none of the same species having been met with by any who examined them. They were hooked near each other on the line, which was set in 14 or 18 fathoms, on very rough ground about six miles north of Burghead, a part of the Firth known as the "Kail-pots," but very seldom resorted to by the fishermen on account of the injury which their lines are apt to sustain by getting foul of the rocks. The two fish were alive when taken into the boat, and at that time their colours were vivid and beautiful, ranging in different parts of the body, from bright green through many a golden tint to a deep orange. They had been dead for nearly two days before I had the opportunity of examining them. The entire length of one was 11 inches, and of the other 10 inches. The colours were still beautiful and distinct, but of a deeper and darker tint upon the larger one, which had its dorsal fin 18—13, while the lesser one had its dorsal 17—14; thus each bore on its back evidence, the one for Yarrell, the other for Jenyns, that these distinguished authors were correct, although their descriptions differ as to the number of the spinous rays. The profile was more on a line with the back than the figure in Yarrell represents it. Neither Yarrell nor Jenyns notices a singular and striking mark, which, if not common to other species of the genus, may readily distinguish this one, namely, two beautiful blue lines or bands, one of which passes directly across the head from eye to eye, and the other runs from the front of the eyes obliquely

to the ridge, which it crosses half way between the first line and the snout. This line is of a deeper tint and broader than the first, or the one farther back on the head. The eyes remained peculiarly beautiful, showing three concentric circles, of orange, blue, and white, surrounding the deep dark pupil, set as a precious gem in the midst of the halo.—*G. Gordon ; Birnie, by Elgin, N. B., November 29, 1853.*

PROCEEDINGS OF SOCIETIES.

LINNEAN SOCIETY.

Anniversary, May 24, 1853.—ROBERT BROWN, Esq., President, in the chair.

This day, the Anniversary of the birth of Linneus, and that appointed by the Charter for the election of Council and Officers, the President opened the business of the Meeting, and the Secretary read notices of Members who had died since the last Anniversary, including eleven Fellows, two Foreign Members, and one Associate. The Secretary also announced that fifteen Fellows and two Foreign Members had been elected since the last Anniversary.

Election of Officers.

At the election which subsequently took place, Thomas Bell, Esq., was elected President; William Yarrell, Esq., was re-elected Treasurer; John Joseph Bennett, Esq., Secretary; and Richard Taylor, Esq., Under-Secretary. The following five Fellows were elected into the Council, in the room of others going out:—Francis Boott, M.D.; William John Burchell, D.C.L.; William Spence, Esq.; Francis Walker, Esq.; and Robert Wight, M.D.

Portrait of Linneus.

Among the presents announced was a portrait of Linneus, copied by Prof. Pasch from the original by Roslin, in the possession of the Royal Academy of Sciences at Stockholm, for Archbishop Troil, by him presented to Sir Joseph Banks, and now presented to the Society by Robert Brown, Esq.; for which the special thanks of the Society were directed to be given.

Vote of Thanks to the late President.

It was moved by Dr. Wallich, seconded by Dr. Boott, and unanimously resolved:—That the most grateful and cordial thanks of the Society be offered to Mr. Brown for the admirable manner in which, for more than three years, he has conducted the business of the Society as its President; together with the great and sincere regret of the Members, that advancing years and the infirmities attending on them should have induced him to relinquish an office, in which it would have been their earnest desire long to have availed themselves of his invaluable services.

Motacilla alba.

Mr. Borrer, jun., F.L.S., exhibited specimens of a rare British bird, the continental white wagtail (*Motacilla alba*), killed at Lancing, in Sussex, in April, 1853.

New British Ferns.

Mr. Newman, F.L.S., exhibited specimens of two species of ferns found in Scotland, and not hitherto noticed as belonging to the British Flora: one of which (the *Polypodium rhæticum* of the 'Flore Française,' but not of Linneus) he believes to be the *Polypodium alpestre* of Hoppe; the other he considers to be new, and proposed to call it *P. flexile*.

June 7, 1853.—THOMAS BELL, Esq., President, in the chair.

Election of a Fellow.

The Rev. Thomas Hugo, M.A., was elected a Fellow.

Nomination of Vice-Presidents.

The President nominated Robert Brown, Esq., William Yarrell, Esq., Nathaniel Wallich, Esq., M.D., and William Spence, Esq., to be Vice-Presidents for the ensuing year.

Specimen of the Dusky Petrel.

Mr. Yarrell, V.P.L.S., exhibited a specimen of the dusky petrel (*Puffinus obscurus* of modern authors). See Zool. 3947 for a paper by Mr. Yarrell on this bird.

Volume of Letters to Philip Miller.

Mr. Westwood, F.L.S., exhibited a volume of letters addressed to Philip Miller by Linnaeus and various other naturalists and others, the property of Mr. Edward Layton, of Watford; the more interesting of which will shortly be published in *fac simile*.

Umbellate Variety of Primula vulgaris.

Mr. Hogg, F.L.S., exhibited specimens of an umbellate variety of the common primrose (*Primula vulgaris*, var. β . of Smith's 'English Flora') gathered in Thorp Wood, near Stockton-upon-Tees, on the 12th of May in the present year.

Artificial Breeding of Salmon.

Read, some "Notes on the Artificial Breeding of Salmon and Trout, with Remarks on the Modes of Fecundating their Ova." By John Hogg, Esq., M.A., F.R.S., F.L.S., &c. After referring to his notice of the artificial breeding of salmon, as practised by Mr. Isaac Fisher, read before the Society on the 4th of May last, and of which an abstract is given in the 'Proceedings,' p. 178 (printed in Zool. 3758), Mr. Hogg gave an account of some further experiments by the same gentleman in the River Swale, made with considerable success, during the past winter and spring. A letter on this subject from Mr. Fisher appeared in the York Herald, dated May 3rd, 1853, from which we learn that ova, placed by him on the 25th of December last in a wooden box with gravel at the bottom, and through which the stream was continuously flowing, had nearly all produced young salmon by about the middle of April. Some experiments made about the same time by the late Earl of Tyconnell, failed of success from want of attention to the *locale*. Attempts were also made by Henry Coxe, Esq., of Scruton Hall, and Major Wade, of Hanxwell Hall, to breed artificially

from trout, in which the latter gentleman had succeeded. After pressing the subject on the attention of all who may have the opportunity of making experiments, Mr. Fisher concludes his letter by a caution against what he considers an incorrect statement, taken from the *Perth Courier*, in which it is said that Dr. Robertson, of Dunkeld, "conceiving that the ova of the female were impregnated previous to their development, within the body of the fish," had taken "a number of live female trout from the spawning-bed, and having extracted the roe, deposited them in a perforated zinc box, containing also some gravel," which was "upon the 14th of October last, placed in a running stream, and on examining the box [in April], several of the ova were found to be hatched." On this latter experiment, Mr. Hogg observed, that the result could only be accounted for by one of the two following methods. Either the ova of the female trout had in some way received the influence of the fecundating principle of the male trout, previous to Dr. Robertson's depositing them in his perforated zinc box; or, the perforated zinc box, which contained the ova as expressed from the females, was placed in the running stream within the fecundating influence of the males. The former solution he finds on the mode of spawning described by Mr. Ellis in his '*Natural History of the Salmon*,' from which it would appear that the male and female fishes having jointly made a furrow in the gravel, place themselves one on each side of it, and throwing themselves upon their sides, "again come together, and rubbing against each other, both shed their spawn into the furrow at the same time. This process is not completed at once; it requires from eight to twelve days for them to lay all their spawn." Mr. Hogg argues from this description, that it is possible that the female trout from which Dr. Robertson took the ova might have gone through this process with the male, and might have thus received the fecundating influence just before she was caught; but on this solution he does not rely. He thinks it more probable that in the running stream in which the perforated zinc box was placed, there were some male trouts which had deposited their milt near the box, and that some of the milt might have been carried with the stream through the holes of the box, and have so fecundated the ova within it. In conclusion, he suggested, that as doubts still exist as to the processes which the male and female salmon and trouts naturally adopt at the spawning season, experiments on the subject might readily be undertaken, by confining them, at the proper seasons, in large glass cases or tanks, covered over with a coarse wire gauze, such as those which have recently been constructed in the water-vivary of the Zoological Gardens. A stream of fresh water, regulated by pipes, could easily be supplied in all districts where the salmon tribe abounds.

Dipterous Parasites of the Earwig.

Read also, "Notes on the Dipterous Parasites which attack the common Earwig and the Emperor Moth." By George Newport, Esq., F.R.S., F.L.S., &c. After remarking that it is well known to naturalists that many Dipterous insects of the family Tachinariæ infest the Lepidoptera, Hymenoptera, and Coleoptera, Mr. Newport stated that he has recently found one of the Dermaptera, also the common earwig, to be subject to the attacks of a species of the same family. He has obtained this parasite, both in its larva and pupa state, from earwigs collected in the autumn in the neighbourhood of London. The earwig is attacked during its larva, or in the earlier period of its pupa state, when the covering of its body is soft and easily perforated. The fly then attaches a single egg to some part of its surface, and the young parasite hatched

from this penetrates into the abdomen of its victim, and there continues to feed until it is full-grown; which is not until some days, and sometimes even weeks, after the earwig has assumed the imago state. The larva then escapes by forcing itself between the segments of the earwig's body, and the victim, already rendered sterile, soon dies. The larva at first moves about very quickly, but soon becomes quiet and changes to the pupa condition, usually within a couple of hours. When this state is assumed during the summer, or in the early part of the autumn, the fly is produced in about a fortnight or three weeks, according to the temperature of the season; but when the earwig's body is not left until late in the autumn, the pupa remains through the winter in the earth, and the fly makes its appearance in the spring; and this also is the case when the larva remains in the earwig's body during winter, and assumes its pupa condition in the spring or early part of summer. The body of the larva is about three-tenths of an inch in length, is soft, white, and tapers anteriorly to a very small but distinct head, which is furnished with a pair of retractile hooks. The body is formed of twelve distinct segments, including the head, and posteriorly has two projecting, corneous, black, tubular breathing-organs. The pupa is oval, smooth, and of a dark brown colour, and retains the breathing-organs of the larva projecting obliquely outwards on either side, at its posterior extremity. The imago fly appears referrible to the *Metopia* of Meigen, and the author proposes to designate it *Metopia Forficulæ*, and to distinguish it as follows:—

“Genus *METOPIA*, *Meigen*.

“*METOPIA FORFICULÆ*, cinerea, oculis testaceis, antennis nigris, corpore pedibusque pilis longis nigris vestitis; thoracis pilis lineas 6 longitudinales efformantibus, scutello alarum basi femoribusque ferrugineis.

“*Muscâ domesticâ* aliquantò minor; Forficulas prope Londinam infestat.”

Parasite of the Emperor Moth.

The author also exhibited specimens of another parasite of the same family, *Exorista* larvarum, which he had bred from pupæ of the Emperor moth, (*Saturnia Pavonia minor*). This species is constantly seen in the early part of summer, in the hot sunshine, on hawthorn hedges, when the larvæ of *Pavonia* are feeding. It appears to be the common parasite of the Emperor moth, in one cocoon of which were the dead pupa of the moth, together with ten living pupæ of the fly. In other cocoons there were nine, seven, six, four, three, and two respectively, and in one instance only a single parasite. The pupa of the moth, in each instance, had been perforated by the parasites, which thus appear to effect their escape into the cocoon, in the larva state, and then into pupæ; as is the case with the Hymenopterous larva of *Ophion luteum* which infests the puss moth. The pupa of this parasite on *Pavonia* differs from that of the earwig in its surface retaining distinct roughened annular indications of the twelve segments of the body of the larva, and also in the breathing-organs being marked by three slight protuberances on each side, at the posterior extremity, above the anus.

Cocoons of the Emperor Moth.

Mr. Newport also described and exhibited two remarkable cocoons of the Emperor moth. One of these had two perfect outlets, but in other respects was a single cocoon, and had contained only one pupa, from which the moth had been developed. The

other was a large flattened cocoon, which, examined externally, appeared but as a single structure, but when opened, was found to have been the joint production of *two* larvae. It was divided internally, by a septum, into two chambers, to which, however, this double cocoon had but one outlet. One of the larvæ had died before changing to a pupa. The other had changed, and had afterwards produced the moth, but which had been unable to liberate itself from the cocoon, owing to the obstacle opposed to its egress by the septum. It had become impacted, and had died in the cocoon in its attempts to escape through the outlet.

ENTOMOLOGICAL SOCIETY.

December 5, 1853.—EDWARD NEWMAN, Esq., President, in the chair.

Donations to the Library and Museum.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for December; by the Editor. The 'Athenæum' for November; by the Editor. The 'Literary Gazette' for November; by the Editor. The 'Journal of the Society of Arts' for November; by the Society. The 'Philosophical Transactions of the Royal Society,' 1853, parts 1 and 2; by the Society. 'On two new Species of Calanidæ, with Observations on the Spermatie Tubes of Pontella and Diapomus, &c.': by John Lubbock, Esq., F.Z.S.; by the Author. 'On the Destructive Powers of Scolytus destructor and Cossus ligniperda': by Captain C. J. Cox; by the Author. A specimen of Plusia bractea; by R. S. Edleston, Esq. Two specimens of a Sciaphila, greatly resembling S. Penziana, from Scotland; by John Scott, Esq., of Renfrew. An extract of a letter from Mr. Henry Doubleday, announced that if this Sciaphila, upon further examination, were proved to be a distinct species, he intended to describe it.

Election of Members.

R. G. Schofield, Esq., Glen Mohr Villa, Greenwich, and W. Groves, Esq., 12, Morden Place, Lewisham Road, were balloted for, and elected Subscribers to the Society.

Distribution of Duplicate Lepidoptera.

The Secretary announced that the Council had determined to distribute the Society's duplicate specimens of British Lepidoptera among the Members.

Exhibitions.

Mr. Westwood exhibited a piece of honey-comb sent to him by a correspondent, in which the queen had laid drone-eggs in worker-cells, which had been enlarged for this purpose.

Mr. Curtis exhibited some Hymenoptera and Diptera he had received from M. Léon Dufour and Signor Passerini, most of them valuable as typical specimens of species described in the 'Annales de la Société Entomologique de France.' In the box also was Tryphon nigriceps, Grav., a species new to this country. It was bred by Mr.

Foxcroft from cocoons of *Trichiosoma lucorum*, which he found in Wales. Mr. Curtis remarked that in 1828 he had bred *Tryphon rufus* from the cocoon of his *Trichiosoma pratense*, the larvæ of which he found in a damp meadow near Ambleside, in the previous year, on a plant he did not remember, it certainly was not whitethorn, but he thought a *Spiræa* or some herbaceous plant. The *Tryphon rufulus* of Stephens is the male of *T. rufus*. These species, from the form of the petiole, belong decidedly to the genus *Mesoleptus*, which Gravenhorst hints at in his work; but the multitude of exceptions to the characters of the genera proposed in the systematic tables, show how imperfect the latter are, and how difficult it is to study the *Ichneumonidæ*.

Mr. Stevens exhibited two specimens of the very rare British longicorn beetle, *Pogonocherus fasciculatus*, taken by Mr. Foxcroft, in the Black Forest, Perthshire, and the new *Noctiluca* from Scotland, but being a female, he had not been able to determine the species with certainty.

Mr. Douglas exhibited specimens of the scarce moth, *Hyponomeuta irrorellus*, reared by Mr. W. Kirby, of Wandsworth, from larvæ found feeding upon *Euonymus Europæus*; and Mr. Stainton exhibited some of the cocoons.

Mr. Wallace exhibited a fine new longicorn beetle, *Acanthocinus* sp.? from California, and a splendid butterfly, *Zeonia Octavius*, *Fab.*, from Pará.

Mr. Smith exhibited two wasps' nests, one formed in a bee-hive and the other in a cask; and he also exhibited a cell of *Anthophora retusa*, containing a larva of the bee and several females of its parasite *Anthophorabia*: and stated that the duration of the life of the males he had observed was seven weeks. Since the last meeting of the Society, Mr. Walker had informed him that he had described the *Anthophorabia retusa* of Newport, as far back as 1839, in his Monograph of the family, under the name of *Cirrospilus Acasta*.

Mr. Westwood, referring to his remarks upon *Anthophorabia* at the last meeting, said that Mr. Smith having afforded him an opportunity of viewing the insect under a high magnifying power, he was convinced that Mr. Smith was correct in saying it possessed true ocelli.

Ravages of Scolytus destructor, &c.

Captain C. J. Cox laid upon the table a block of wood perforated by larvæ of *Cossus ligniperda*, and pieces of the wood and bark of elm and ash, illustrating the different ways of mining pursued by the larvæ of *Scolytus destructor* and *Hylesinus Fraxini*. For several years he had devoted his attention to these insects, especially the *Scolyti*, and he was convinced that their ravages were so extensive as to be of great importance. Some of the oldest and finest elms in the parks had been destroyed, and young sound trees were not exempt from their attacks. In opposition to several distinguished entomologists, he was convinced that *Scolytus destructor* attacked sound trees and caused them to become diseased, partly through the influence of a poison contained in the excrement of the insect; and a course of experiments had not only assured him on this point, but had also enabled him to state to the Office of Woods and Forests that the damaged trees might be saved and the pest prevented from spreading, if they would adopt his plan of partially barking the trees in the places attacked, and removing and destroying the portions cut off. Once when in a ship-timber yard, where he had a yacht building, he saw an ash-tree so covered with these insects, that he calculated there were not less than 280,000 of *Hylesinus Fraxini* in it; the *Scolytus* was certainly quite as prolific, and unless some such steps as he had pointed out were spee-

dily adopted to check the evil, he would venture to say that in sixty or seventy years there would not be an elm-tree in or about London. The damage caused by *Cossus ligniperda* was very great, and he also attributed a poisonous quality to the excrement of the larvæ; but he found that if the larvæ were followed up and cut out, the trees soon recovered. He said that in the Royal Botanic Society's Gardens, Regent's Park, out of two hundred and forty trees, only ninety had escaped being attacked, and out of eighteen operated upon, all had done well except one.

Mr. Westwood said his late lamented friend, Audouin, who had paid great attention to this subject, had once when he was visiting Paris, pointed out to him that a female *Scolytus* first attacked a tree for food, and then other females followed to lay their eggs on the perforated and exposed place.

Mr. Edward Sheppard said that he had found the insects alive in old elm rails.

Mr. Curtis had never known young trees attacked; but at St. John's Wood his attention had been called to some old elms, which had completely lost their bark from the attacks of *Scolytus*; and he thought that only trees in an unhealthy state, which frequently happened from many causes, or old trees decaying, became the prey of this beetle.

Captain Cox replied to these objections:— 1. That he was sure, from observation, that the females laid their eggs on sound trees, to which they went for that purpose. 2. That he had known the insects eat down into the solid wood, but only when they had deprived the bark and alburnum of their nutriment. And, 3. That the majority of the trees in the Regent's Park were growing vigorously, even to the terminal shoots, when attacked. He added that the efficacy of the plan he recommended as a cure, was proved by the fact, that trees rapidly in process of destruction by *Scolytus* and *Cossus* had, after the operation, become quite healthy.

The President, in concluding the discussion, said that the Society was greatly indebted to Captain Cox for his lucid explanations on a subject of such great importance and general interest. Without wishing in the slightest degree to undervalue those exhibitions of rarities, or those descriptions of genera and species which formed the staple of the Society's proceedings, he considered that carefully prepared observations on the habits of insects possessed a still higher value and interest, more especially when such habits exercised an important economical influence, whether beneficial or injurious. He also wished to observe, that in discussions like that which had just taken place, and to which he had listened throughout with the utmost attention and pleasure, it would be a great advantage if a month's notice could be given, in order that members might have the opportunity of refreshing their memories by referring to what had been previously written on the subject, in fact, of "reading up," so to speak, for the occasion, for we really came as it were unprepared, and treated almost as new, a subject to which our best entomologists had already given their earnest attention. With regard to the opinions advanced and ably advocated by Captain Cox, he inclined to offer two remarks. First, in reference to the *Scolytus* attacking young and sound trees, he thought the Captain's views were fully borne out by the sound and healthy wood of a young tree which was exhibited, and in which the ravages of the insect had been closely watched from their very commencement, until they caused the death of the trees: this view was also in accordance with his (the President's) own observations on the trees in Camberwell Grove, where he had for years watched the progress of the pest, and found it extended indifferently to old and young, sound and unsound trees. The other remark he wished to make was, that he dissented from

Captain Cox's opinion, that any poison was diffused by the insects, either in the case of the Cossus or Scolytus; he attributed the injury to simple mechanical causes, since the galleries or perforations of these insect-pests either arrested the flow of sap altogether, or diverted it from its ordinary channels; the admission thus given to rain-water, and also to other insects, likewise tended to accelerate decay.

Butterflies of the Valley of the Amazon.

Mr. Wallace read the concluding portion of his "Notes on the Habits of the Butterflies of the Amazonian Valley."

Mr. Westwood, in reference to a remark in Mr. Wallace's paper, that a certain species of *Hesperia*, with a very beautiful under surface, sat with its wings erect, observed that Nature generally provided that adornments of this kind should be exhibited; it was particularly the case with the *Catocalidæ*, which, having very beautiful under wings, rested with the upper wings open, so that the under wings were exposed.

Mr. Curtis differed from Mr. Westwood; he thought that in the genus *Catocala*, especially in *C. nupta*, this was not the case.—*J. W. D.*

Note on a Bat on the wing in December.—December 11, 1853. A bat flying in Talland church during divine service: the weather gloomy, thermometer 38°. The vicar informs me that in the autumn, when he entered the church in the evening, bats were flying about in it in great numbers: and also, that when tradesmen were repairing the roof, as many bats were caught as might have filled a wheelbarrow.—*Jonathan Couch; Polperro, December 12, 1853.*

The Serotine Bat (Vespertilio serotinus) in the Isle of Wight.—Dr. Martin having already recorded the occurrence of this bat at Ventnor, it may be worth while mentioning, as giving additional localities, that the same species is quite common in the neighbourhood of Bembridge, where I have observed it for several years past, and in fact it was the only large bat that I was able to procure there. During my stay at Brixton, I have also noticed it in a few instances at the beginning of November last.—*A. G. More; Brixton, Isle of Wight, December 7, 1853.*

Further Occurrence of the Little Bustard near Penzance.—Another specimen of the little bustard I observed to-day hanging up in a poulterer's shop in this place, and purchased it for half-a-crown. I was told at the time that another had been offered last evening, and four or five killed in the neighbourhood. The wind has been from S.E. to S. for some days, and the bird has been shot some days.—*Edward Hearle Rodd; Penzance, December 22, 1853.*

Occurrence of the Goosander (Mergus Merganser) at Scilly.—Last evening I obtained from Mr. Smith, the proprietor of the Scilly Islands, an adult female specimen of the goosander, exhibiting on the breast a bright maroon-colour, uniform throughout. These Arctic birds are not often seen so far South.—*Id.; December 24, 1853.*

Remarks on the Larvæ of Æcophora and Elachista. — Many entomologists labour under the impression that there is nothing to be done during the winter months, at least among Micro-Lepidoptera. "It may be very well," say they, "for a beetle-hunter to go poking into old stumps, and picking up moss, but that sort of game don't suit us." So, as nothing is to be got by poking into old stumps, nobody thinks of looking, and nothing is got; but is the assertion true? It has several times been recorded that *Dasycera sulphurella* feeds, as larva, under the bark of decaying trees; has it alone that habit? Where did Mr. Wing find the larvæ of *Æcophora unitella* last spring? In some old pea-sticks, which he had used in the formation of an arbour. Where did Herr Richter find the larvæ of *Æcophora similella* (*stipella*, Sta. Cat.)? Under the bark of decayed fir-stumps, which were brought to his house as fire-wood. Now, in order to discover the larvæ of the species of a genus, you must first discover that of one species, next assume that the habits of the others are similar, and look for them in the then most likely places. The larvæ of *Æcophora angustella*, *Woodiella*, *formosella*, *lunaris*, *Lambdella*, *subaquilla*, *Panzerella*, *tinctella* (*arietella*, Sta. Cat.), *flavifrontella* and *fuscescens*, are unknown; *probably they are all rotten-wood feeders*. Professor Zeller found *Æ. formosella* rather freely last summer in a wood-yard, along with *Æ. unitella*. This strengthens previous suspicion. Most of the other species appear, by their haunts, to frequent places where their larvæ might have fed upon decaying wood; *Æ. Lambdella*, originally found *swarming in a furze-bush, may feed in the decaying stems of the furze*. If *formosella* and *Lambdella* won't tempt an entomologist out in January, I don't know what will. And it should be borne in mind, that probably all these species feed, like *Dasycera sulphurella*, throughout the winter, so that from December to February, when other sport is scarce, is the very time to seek for the *Æcophora* larvæ. When the collector is weary of poking into the old stumps, he can agreeably diversify his occupation by collecting *Elachista* larvæ, of which he had probably destroyed several by treading on them, whilst at work on the *Æcophora* larvæ. They are to be found mining the leaves of grasses, preferring such long grasses as grow in the shelter of a hedge, or at the foot of a tree: he may here find a goodly variety, hardly two grasses containing the same larvæ. These again may be found throughout the winter. I am purposely brief, as I know you are pressed for space: my sole object is to dislodge a few well-meaning entomologists from their fire-sides; if they want further information, I shall be happy to give it.—*H. T. Stainton; Mountsfield, Lewisham, December, 1853.*

Correction of an Error in the Note on the late Appearance of Insects.—Allow me to correct an error in my note on the late appearance of insects, (Zool. 4129). It is this: — Instead of the capture of *Semiophora Gothica* "on the evening of Tuesday, the 19th of June last," it should be, "on Tuesday, the 19th of July last." Had their capture been on the 19th of June, I should not have thought it so late as to be worthy of note; but a month on to that again makes a deal of difference. There can be no mistake about its having been the 19th of July, and not June, for that day was the first day's collecting I had this season; moreover, I only went into Dorsetshire from home on the Saturday before, (the 16th).—*Octavius Pickard-Cambridge; Hatch Beauchamp, December 2, 1853.*

Occurrence of Zygæna Minos in Ireland. — I am informed by my friend, Mr. Thomas H. Allis, that about a dozen specimens of *Zygæna Minos* were taken last summer on the west coast of Ireland, by Henry Milner, Esq., of Nunappton, near York.—*Edward Newman.*

Entomological Localities. By J. W. DOUGLAS, Esq.

(Continued from page 4001).

TERRA INCOGNITA.

THERE is a mystery respecting those persons who, having been ardent entomologists, blazing for a time like comets, like them also vanish. Keats, the poet, it is said, "was snuffed out by an article;" — a very definite one it must have been! Entomologists are men of sterner stuff; and though they have at times been impaled on the point of a pen dipped in gall, there has been only a passing irritation; none of them ever died of such a wound. And yet, the passion appears to die out with some before its time. Does the *afflatus* become extinct, or is it not rather overlaid with the pleasures of sense or the cares of life? Every one that drops Entomology, has lost some of the higher enjoyments of his nature, even though he has been but a collector of specimens. It is common to decry the mere collector, and to exalt the cut-and-dry naturalist of books and systems. Neither course is necessary or proper; they are mostly two different kinds of men; the qualifications required for the two employments are seldom conjoined in one individual, and without the collector the book-maker could not exist. The out-door naturalist has a higher source of beauty and impulse to devotion open to him, and his occupation should rank higher in our estimation. I know men who have devoted a life-time to collecting, — wandering in the woods and fields; and if they are not saints, still, who shall say how much better they are for the amenities of Nature with which they have been so familiar, than they would have been without such influences!

Constant change is a law of Nature, and the great charm of human existence is a corresponding love of the novelty. Gray, the poet, himself a naturalist, said the best way to enjoy life was constantly to have something going on; the naturalist, and especially the entomologist, is always in a position to fulfil this condition, and is the last man to find time hang heavy on his hands. I know his employment has been called "busy idleness;" and in this country, where the majority of the inhabitants are either engaged in trying to avoid being killed by the climate, or, escaping this Scylla, fall into the Charybdis of commerce, and are used up in its service, it may seem so; and yet it might very advantageously be used to palliate the *ennui* of the one

of these classes or the exhaustion of the other. "Heaven lies about us in our infancy," says Wordsworth; the entomologist may in truth say it still surrounds him in his maturer age, simply because he has not, like those who cavil at him, suffered the cares of life to spread their mist over the meridian of his existence. After all, the value of Entomology lies not so much in the boundless extent of materials it affords for mental employment, as in its reflex action on the minds of its students: but this view of the subject deserves a chapter to itself, and some day I may write one.

My chief object in writing now is to persuade apathetic collectors, and, it may be, some who have never collected insects at all, that however industriously any district may have been worked, it may still be deemed a "*terra incognita*." On the cover of his 'Nomenclature' Mr. J. F. Stephens records the occurrence at Coombe Wood of *Cucujus ater*, *Oliv.*, upon ground that he had investigated for twenty years and upwards; and in his own garden at Kennington, a spot continually under his eye, he one day found *Selandria sericans*, *Hartig*, a new British species of Tenthredinidæ. Such cases continually come under our notice, and many instances might be adduced to show that even when man has altered all the features of a country, and "annexed" the land to his dwellings, if he has destroyed some races of insects entirely, he has given an impulse to the propagation of others. But I am now more concerned to state that on the same ground, without very apparent changes, the produce varies in quality and quantity year by year, and that every season will offer something fresh. Then new methods of capture come into operation, and lo! a new creation seems to arise. Witness the number of species and the quantities of specimens of moths, with which *sugar* has made us acquainted. *Lights for attracting* require to be more tried in proper localities: many rarities, and probably novelties would result. *Digging for pupæ* is a method that, in the hands of a person like the Rev. Joseph Greene, leads to surprising consequences. *Rearing from the larva state* has still too few adherents; a rich harvest is to be gathered, especially in the Pyrales, Tortrices, and Tineæ. *The fumigating principle* has also to be more extensively tried; I have no doubt it will diminish our list of rarities. All this is to be done with Lepidoptera, and the field in the other Orders, with the exception perhaps of the Coleoptera, is not better occupied.

Let no Diogenes, then, who occupies himself only with the insects of his native land, fancy he has exhausted his quota, and listlessly retire into his tub; nay, even then, the narrow limits of his observation

would afford more entomological questions than he could answer, and prove a "*terra incognita*" for him to explore.

There are, nevertheless, a few Alexanders among us, who sigh for more worlds to conquer. So be it. Be it our business to work up the Entomology of Britain; let it be theirs to do their best for the lands to which fortune or favour may direct them. I wish there were more such men; for, as it is, the field is disproportionate to the labourers, and ere long there will be many more openings. China, for instance, what a glorious chance for a life-time of collecting new forms in a new country — unknown to naturalists, except in part by one Englishman —

"O *fortunatus* puer!"

Can there be any dangers or difficulties in that flowery land sufficient to deter? Who will go up and possess it? Then, again, Japan! — where, after our Brother Jonathan has employed the gentle persuasives of his gunpowder in the cause of the almighty dollar, — will no one follow his philanthropic footsteps for the purposes of Entomology? * India, and the isles of the Indian Seas, rich as they must be beyond all idea, would absorb many devotees of the science. Africa, mostly unknown, and Australia as little, cry out for more, and, behold! we have no *corps de reserve* of naturalists to occupy the posts as opportunities occur. Commerce itself, to the inordinate attention to which may be traced the apathy with which Natural-History science is generally regarded, may eventually be more deeply injured than is thought, by the absence from new countries of observers of their productions, and which, only after a long interval, become articles of trade. It is surely time that England taught her sons, through her public schools, so much of the myriad forms of vegetable and animal life, that when, in fulfilment of their presumed destiny to wander over the earth, they alight in a new country, they may not find it to be quite so much as now a "*terra incognita*."

This is now, therefore, no time for any one, to whatever department of Entomology he may have been attached, to hang up his armour or let it rust. Moreover, as our old commanders, one by one, fade into the spirit land, it seems more and more a difficulty to see among the rank and file those who are to supply their places; and a proper consideration of the subject would, I think, show that instead of any

* Since this was written, news has arrived that Commodore Perry has given the Emperor twelve months to consider the President's letter, when he will call for the answer; if it be not favourable, why then——we shall see

seceding from the cause, every one should use increased exertions to cultivate the science in himself and others.

J. W. DOUGLAS.

Lee, Kent, November 3, 1853.

List of Lepidoptera captured near Aylesbury, Buckinghamshire.

By the REV. JOSEPH GREENE, M.A.

THE readers of the 'Zoologist' have been made acquainted, through the communications of Mr. Douglas, Mr. Stevens, and others, with the entomological richness of the well-known Black Park, in the county of Bucks. The following list of insects captured by me during my residence of eighteen months at Halton, near Aylesbury, will show that that part of the county is not at all inferior to the above-mentioned locality.

Polyommatus Argiolus. Scarce, in Beech Wood, May.

Nemeobius Lucina. Abundant in Beech Wood, May.

Arge Galatæa. One, August 2. The capture of a *single* specimen of this insect is strange, as, though very local, it is common where it occurs. In Gloucestershire I found it, in some places, as abundant as the common cabbage white. The above was the only specimen I ever saw in Buckinghamshire.

Sesia Fuciformis. One, May 26, border of Beech Wood.

I have met with the empty pupa-cases of *Ægeria Apiformis* and *Æ. Bembiciformis* sticking out from the trunks of trees, but never saw the insects.

Sphinx Convolvuli. One female, July 17, hovering over honeysuckle.

Lithosia rubricollis. Extremely common in Beech Wood. Pupæ in abundance under moss on decayed trees. This insect appears to be subject, in an extraordinary degree, to the attacks of an *Ichneumon*. I collected about 300 pupæ last winter, and having distributed a considerable number, I kept the remainder: of these, only eight came to perfection, the rest producing only *Ichneumons*.

Lithosia aureola. Scarce, in Beech Wood, May, 1852.

„ *griseola*. Very common in hedges, and bred from larvæ found feeding on plantain, in June.

Orgyia Coryli. Larvæ and pupæ very common in Beech Wood. The larva is polyphagous, feeding on beech, maple, hazel, oak, &c.; the pupa is found under moss on those trees.

Trichiura Cratægi. One larva on hawthorn.

Pœcilocampa Populi. Pupæ at the roots of poplar, ash, and elm, scarce.

Platypteryx unguicula. This insect was extremely common last year in May, flying in Beech Wood, by day. The female is much rarer, and does not fly by day. It is double-brooded, as I bred it this year in August, from larvæ found on beech in July.

Cerura furcula and *bifida.* Larvæ on poplar and willows; pupæ on trunks of poplars.

Stauropus Fagi. Five; two males: one female pupa under moss on beech, in Beech Wood, and two larvæ now in pupa.

Asteroscopus Cassinea. One larva on willow.

Pterostoma palpina. Pupæ at roots of poplar; larvæ not very uncommon on poplar.

Notodonta Camelina. Larvæ and pupæ in great profusion, the former upon beech, oak, hazel, &c., the latter under moss on beech, in Beech Wood. I mention this species as affording a curious illustration of the uncertainty of appearance, in point of time, of some insects. I had about seventy pupæ this year; the first insect appeared on the 9th of May, the last not until the 4th of August.

Notodonta cucullina. About forty-five larvæ on maples, in Beech Wood. I took mine by beating, in August and September, and found maple-shrubs the most productive, especially such as were situated in the denser parts of the wood, a circumstance not usual, as far as my experience goes. Like others of this genus, it seems very subject to the attacks of an *Ichneumon*. It varies much in appearance, but, in healthy specimens, is generally of a dull green, with a dark patch on the anterior segments, and greatly resembles *N. Dromedarius*.

Notodonta dictæoides. Larvæ and pupæ not uncommon on poplar.

„ *Dictæa.* Larvæ and pupæ on poplar, much scarcer than *dictæoides*.

„ *Dromedarius.* Rare; twelve larvæ on hazels, but nearly all stung by *Ichneumons*.

„ *ziczac.* Larvæ very common on willow and poplar.

„ *trepida.* Five larvæ on oaks, four being stung.

„ *Chaonia.* Three larvæ on oaks, all stung.

Ptilophora plumigera. One larva on maple, May; produced the perfect insect October 27.

Gluphisia crenata ? I am in hopes that a larva, beaten from poplar, is this insect.

Semaphora tridens. Scarce ; larvæ on hazels, September.

Acronycta Alni. One larva on oak, which unfortunately died.

„ *Ligustri*. Pupæ in great profusion under moss on beech and ash, Beech Wood.

Ceropacha ocularis. Two pupæ at roots of poplar.

„ Or. Larvæ not uncommon on some poplar shoots in Beech Wood.

Cymatophora viminalis. Larvæ on young willows, uncommon.

Miana arcuosa. At light.

Apamea unanimis. Larvæ hybernating under moss on poplars near marshy places : they turn to pupæ about the beginning of June, without feeding.

Cerigo Cytherea. Common at light.

Spælotis ravidæ. On lime-blossoms, rare.

„ *pyrophila*. One, on flowers of *Syringa*.

Agrotis corticea. Two, at light.

„ *cinerea*. Three, beaten out of beech, and seven attracted by light.

Neuria Saponariæ. Not uncommon at light.

Tæniocampa Populeti. Two pupæ at roots of poplar ?

Tethea subtusa. By beating, and larvæ on poplar, May.

Cosmia diffinis. Pupæ at roots of elm, July.

Xanthia aurago and *citrago*. Larvæ on limes.

Cirrædia Xerampelina. One beautiful female beaten from ash.

Ash appears to be a favourite resting-place for the *Xanthiæ* and allied species, as, in addition to the above, I have beaten *X. aurago*, *citrago* and *silago* from that tree.

Dianthæcia carpophaga. One, at light.

Hadena adusta. Common, at light.

Aplecta advena. Ditto.

Geometra Papilionaria. Two pupæ at roots of oak.

Chlorochroma vernaria. Scarce, beaten from hedges.

Pericallia Syringaria. Not uncommon in the garden.

Eurymene dolabraria. Pupæ not very uncommon under moss on beech-trees in Beech Wood, but difficult to get without injury.

Ennomos illustraria. One pupa under moss on oak, Beech Wood, and larvæ ? on hazels.

„ *fuscantaria*. One larva beaten from ash.

„ *Tiliaria*. Larvæ beaten from poplars.

Aventia flexularia. Five specimens beaten from hedges.

Anisopteryx Æscularia. Male and female, pupæ at roots of elms.

Hibernia leucophæaria. Ditto, ditto.

„ *rupicaprararia*. Ditto, ditto.

„ *progemmaria*. Ditto, ditto.

„ *aurantiaria*. Ditto, ditto.

„ *defoliaria*. Ditto, ditto.

Phigalia pilosaria. Ditto, ditto.

I mention these insects, as pointing out an easy method of obtaining apterous females. *H. aurantiaria* and *defoliaria* should be looked for not later than September. The larvæ select the dry corners about the roots of elms, sheltered from the rain &c: such a predilection have they for these little dry nooks, that there appears to be quite a struggle for the possession of them; and I have sometimes found as many as six and even seven cocoons all fastened together in one bundle! *P. pilosaria*, however, like *Biston Betularia*, seems to prefer the *edges*, and not the *corners*, of the tree.

Biston prodromaria. Pupæ at roots of oak.

„ *Betularia*. Pupæ at roots of elm, in plenty.

„ *hirtaria*. Pupæ at roots of elm, scarce.

Tephrosia consonaria. In immense profusion on trunks of beech-trees, in Beech Wood, at the beginning of May. The insect emerges from the pupa about two in the afternoon, at which time I have seen them by dozens drying their wings on the trunks of the trees. The male is not nearly so brightly coloured nor so distinctly marked as the female, and appears as if wasted or rubbed. This, however, is certainly not the case, as I have had the insect in all its stages, and have, as above remarked, repeatedly taken them immediately after emerging from the pupa. In all cases, the male presented the same dim and dusky appearance. This is one of the few insects I have taken in the pupa-state at the *roots* of trees in woods.

Boarmia Abietaria. A few specimens beaten from firs, Beech Wood.

Anticlea rubidaria. Five, beaten from hedges,

Phæsyale miaria. Pupæ at roots of birch.

Ypsipites ruberaria. Pupæ under loose bark of poplars.

Lobophora sexalisaria. Pupæ, I do not know at what tree.

Eucosmia undularia. Two pupæ; where found I cannot say.

Eupithecia sobrinaria. Not uncommon at light.

„ *rufifasciaria*. Two pupæ at roots of oak.

„ *Fagicolaria*? Extremely local, being confined to one open spot in Beech Wood, but very common there.

- Eupithecia innotaria.* Same locality, but very scarce.
 „ *piperaria.* Ditto, ditto.
 „ *Centaurearia.* Scarce, at light.
 „ *subfulvaria.* Ditto.
 „ *pusillaria?* Ditto.
 „ *succenturaria.* One, beaten from a hedge, August.
 „ *togaria.* Two, beaten from firs, Beech Wood.
 „ *subumbraria.* Common, beaten from maples, ditto.

The commoner species are omitted from the above list.

JOSEPH GREENE.

47, Stephen's Green,
 Dublin, December, 1853.

A few Notes on the Necessity for Rearing all the Tineidæ and other small Groups. By JOHN SCOTT, Esq.

THE success which has attended my search for, and the rearing of, the larvæ of the Tineidæ, small though it may seem, urges me to lay it before other Micro-lepidopterists, in the hope that it may induce some few of them to commence the rearing system for themselves, instead of the exchanging system which is so universal. I do not deprecate this last mode, as undoubtedly many insects are only to be obtained by this means by parties living in different localities, but still, from a want of knowledge of the insects in their earlier stages, we cannot tell to what extent this may hold good. Many things, no doubt, want only the looking for to be found, which, from the retired nature of the perfect insects, have hitherto escaped notice. And when we meet with them thus, and then only by one or two at a time, they are in general so much worn as to be scarcely fit to be called specimens. Now the larvæ of these insects, when once met with, are found in abundance, and it is only by minutely scrutinizing each plant, and exercising an abundant display of patience, that we can hope to find them. Besides, it is as easy to exchange the larvæ as the perfect insects; and perhaps tin boxes are best suited for this purpose, as they keep the food fresh while on its transit, whereas chip or pasteboard boxes would extract all the juices from the plants, and thereby deprive the larvæ of nourishment, and cause their death. Nor is there any fear to be apprehended from the post-office functionaries doing such a "heavy business" as to break through the lid or bottom, for I verily

believe that they seem to hold it as part of their duty to be very *marked* in its performance. For rearing-glasses, I have used confectioners' show-glasses of various sizes. These are very cheap, and answer the purpose very well.

The number of unique insects to be met with in various cabinets throughout our island, is the first reason I would urge for the rearing system; the second is, that it is the only way to obtain a fine series of these smaller creatures, and is besides the only effectual way of determining whether these so-considered unique insects are distinct species or merely varieties. No doubt there are many who cleave to old systems with all the fondness of fathers, and who may be hard to convince that such systems are not true; and I believe it to be perhaps a difficult thing for many to forsake, without a struggle or a sigh, those forms and systems which they have followed from their childhood, and to adopt others without a murmur or an indignant thought at the inroads made into their seeming perfect schemes. But I would ask if such forms and systems are opposed to the keener observation of men of later days; if these later men have watched over all the changes, have noted the transformations, have watched all the irregularities of these species, and established such facts as do really exist; are not these men balancing the lists and giving to each insect its proper place? Let any one examine for himself the lists published a few years back, and compare them with those of recent date, and he will find how very diligent early authors have been in creating new genera and species, owing to their taking only the perfect insects which have been more or less subject to variation. See, for example, the Tortrices in Mr. Doubleday's list, or indeed many of the Noctuæ, and again in Mr. Stainton's list of Tineidæ, &c. This was collecting, in those days, and a variety of a very common insect in many cases stood as *unique* in Mr. So-and-so's collection. In our day, I maintain it to be our duty to work out from the foundation, so far as is practicable, the history of every insect with which we may meet, so that we may be enabled to see more clearly the wondrous workings of the Great Creator, and set at rest the little difficulties which have arisen in former days in regard to these unique specimens.

But though these mistakes have arisen, still there is a good deal to be said in their favour: for, if we trace back the history of insects a little way, we become astonished at the very few of our countrymen who have done anything towards advancing the pursuit of Entomology, indeed it seems to have been looked upon as a thing with which man had no reason for troubling himself about. "A lamentable thing

that we should be troubled with these strange flies," since there was no money to be made by them ; and the "loud laugh that spoke the vacant mind" has often been heard on seeing the peaceful "fly-catcher," net in hand, stealing away through the bushes, or, may be, chasing some prize. Nor is this quite worn out, although it is waning fast, and many are beginning to think that persons thus engaged have really discovered more than beauty in a butterfly's wing, and that the dirty disagreeable beetle must possess something which they had not hitherto observed. Surely,

"Nought so vile that on the earth doth live
But to the earth some special gift doth give."

Now there are modes of obtaining many of the larger genera and species which is not the case with the smaller ones ; and these are so well known that I need not pause here to enumerate them, but will at once proceed to some of those larvæ which live inside the leaves of some of the grasses. No sooner does spring begin to clothe the fields in their garment of green, and revive by her grateful cares what the stern hand of winter had apparently crushed for ever, and long before the stately forest-trees are mantled, and their bare arms lost in the rich foliage ; long before the bushes in the copses nod to each other so fantastically in their summer suits ; long before the wood-banks give forth their balmy breath ; these little prisoners of Providence have begun their work. Stormy March, sweeping over hill and dale, through wood and glade, across moor and common, down highway and byway, affects them but little ; silently and ceaselessly they do their work. A little examination, and but a little, even thus early, of the grasses growing on dry hedge-banks, by the sides of pools, or, in short, wherever grass flourisheth, will reveal traces of the paths of miners down the leaves, or sufficient discolouration or other evidence thereon to lead to the detection of the cause of these injuries. The leaf requires only to be pulled up, and held between the eye and the light, when its occupant may be seen, if it has not left for another tenement.

Any one might hastily be apt to think that there could be no variation in the methods of mining, — that such narrow houses could never admit of any digression from a regular rule. This, however, is not the case. Some of these larvæ carry with them the whole breadth of the leaf in their passage, and never enter the stem ; while others, again, make a passage in the leaf, just sufficient for their bodies to pass down, then another passage, and finally penetrate far down into

the stem. Nor are the larvæ all of one colour, for some are pale, others greenish, and a third kind inclined to black; and it is not uncommon to find a pale larva eating up, and a dark one eating down, the same leaf, or *vice versâ*. These mining larvæ, so far as my own experience has gone in rearing them, have all proved to belong to the genus *Elachista*, and the perfect insects produced have been *E. albifrontella*, *luticomella*, *bisulcella*, and *Cygnipennella*: no doubt continued research will reveal many others, of which at present we know nothing in their earlier stages. *Kilmunella*, *Bedellella*, *cerasiella*, *Rhynchosporella*, *Eleochariella*, &c., are only known in their perfect state, and to rear any one of these would amply reward the collector for his trouble.

When about to assume their transformations, these larvæ quit the interior of the leaves, and either suspend themselves by a fine thread to some of the leaves, or descend to the ground, on the top of which they spin up, and make for themselves cocoons composed of a few loose particles of earth. To rear them is not a very difficult task, the great enemy to contend with being the *Ichneumon*; and therefore the collector must not be disheartened at the number which will die on his hands. The *Ichneumon* would seem to attack the larvæ when very young, as I have lain for a couple of hours beside a large tuft of *Aira cæspitosa*, filled with larvæ in various degrees of growth, without seeing the operation, and have afterwards brought it home, and from the whole lot which it contained, have reared but two or three moths. Sometimes the parasite only bursts forth in its perfect state, and at others when about to change to the pupa. I have taken as many as fifteen parasitic larvæ from a single caterpillar about three-eighths of an inch in length by a thirty-second in diameter. They were so closely packed and arranged, that they gave to the creature the appearance of a miniature chain cable.

My paper has become longer than I intended, and I must therefore conclude, under the hope I have already expressed that some will be induced to profit by it, and that next season the pages of the 'Zoo-logist' will attest the industry of those anxious to benefit their brethren and to increase their own knowledge of the study which they profess to combat with.

JOHN SCOTT.

London Works, Renfrew,
December 6, 1853.

Micro-Lepidoptera taken near Clevedon.—The following were among my best captures during the early part of the past summer:—

Eulia ministrana, Norton Wood, end of May, flying at dusk.

Halonota trigeminiana, beginning of June.

Retinia Buoliana, reared from shoots of Scotch fir, second week in July.

Ephippiphora perlepidana, near Walton Castle, third week in May.

Cnephasia obsoletana, July 19.

Syndemis musculana, one specimen by beating, Norton Wood, May 31.

Chrosis tessarana, Walton Down, middle of June.

Micropteryx mansuetella, cliffs towards Ladies' Bay, beginning of June.

Nematopogon metaxellus, by beating, Norton Wood, end of May and beginning of June.

Psecadia decemguttella, one specimen, July 4, at the root of a beech-tree on Walton Down.

Depressaria ultimella, May 25, by beating.

Gelechia cinerella, July 19.

Coleophora lizella, Walton Down, July 4.

Elachista albinella.

Lithocolletis Corylifoliella, Norton Wood, by beating, beginning of June.

Pterophorus microdactylus, end of June and beginning of July, on Walton Down and Elton Hill.

„ *tetradactylus*, Walton Down, beginning of July.

Together with some *Nepticulæ* &c., which I have not as yet satisfactorily determined.

—*Alfred Merle Norman*; *Clevedon, Somerset, December 23, 1853.*

Mortar Cocoon of Cerura Vinula.—The instance of a puss-moth caterpillar forming a cocoon out of the tuber of a potato, when apparently driven to it by necessity through being confined in a glass vessel (*Zool.* 4107), brought to my recollection a most curious freak of this creature which I once had the pleasure of seeing. At the time (September, 1847), I was a boy at Winchester, and the following is an extract from my note-book:—“While walking round ‘Meads,’ I saw on the wall something which I mistook for a piece of mortar, but seeing that it looked newer than the rest of the wall, and projected a little from it, I pulled it off, and to my astonishment found it to be the cocoon of the puss moth, most admirably made out of the rotten mortar.” Not the least curious part of the story is, that the moth came out quite perfect. The caterpillar, I imagine, had lived on a poplar growing close by, which was too young to allow of its forming its cocoon on the stem, and therefore it was driven to what I believe to be a totally novel expedient in insect architecture.—*Id.*

Capture of Larvæ of Dianthæcia carpophaga.—When I was in Derbyshire in July last, I took between thirty and forty larvæ of *Dianthæcia carpophaga* feeding upon the seeds of *Silene inflata*. It is generally, I believe, considered to be a very rare insect, but from observations which I have made during the last two years, I have reason to think it not nearly so rare (at least in the larva state) as it is generally thought to be. I have taken it in Flintshire, Derbyshire, Bucks and Herts; and have good reason to think that it may be found wherever *Silene inflata* grows in any abundance. The larva lies coiled up between the calyx and the seed-vessel of the plant. It is a very delicate caterpillar, and extremely difficult to rear. Though I have occasionally taken the larva for some years past, I never succeeded in rearing it, until last year, when I took a considerable number in Herts and Bucks, but only bred five moths, and

this year I have only nine pupæ out of between thirty and forty larvæ. It almost invariably feeds upon the seeds of *Silene inflata*, although I have occasionally found it upon the flowers of the double variety of *Lychnis dioica*, and upon the seeds of *Silene nutans*.—*H. Harpur Crewe; Rossway, near Great Berkhamstead, Herts, November 28, 1853.*

Capture of some of the rarer Hydropori in the North of England.

By THOMAS JOHN BOLD, Esq.

HYDROPORUS elegans, Illig. I take a strongly marked variety of this common insect in Talkin Tarn, Cumberland. At first sight they much resemble *H. 12-pustulatus*, being much larger and darker coloured than the specimens of *elegans* from running water. Some have the elytra wholly black, except a narrow yellow margin; others are more or less lineated with yellow; and scarcely any of them have the spotted appearance characteristic of the species.

In dredging for this insect, I had a striking proof of an oft-noticed fact, that the "sunny side" of a pond is always the most productive. I worked for upwards of an hour on the north side of the lake (where I once met with it in plenty), but it being then in the shade of the neighbouring pine-trees, I did not get half-a-dozen specimens. On changing to the south and sunny side, however, I soon brought to light a sufficiency to make up for previous disappointment.

H. rufifrons, Duftsm. = H. piceus, Steph. I have, at different times, taken about a dozen of this conspicuous species. It frequents deep pools, and when secured in the net, marches from amidst the débris with a slow and stately gait.

H. nigrita, Fab. I know not whether this is in reality a rare species, or merely local. I have only once met with it, and then most unexpectedly. When broiling under an unclouded sun, on one of the wild Cumberland moors, my friend and I drew towards a spring, with the bibbing intentions of thirsty sportsmen; but our dogs having like propensities (though not so alcoholic), and a better local knowledge, getting there before us, soon rendered the water unfit for human consumption. On trying my net, I found that the well was tenanted, almost exclusively, by *H. nigrita*, which appeared to be confined to it; for although I tried many of the pools in its neighbourhood, not an individual could I find elsewhere.

H. Gyllenhalii, Schödte, = H. rufifrons, Steph.

H. tristis, Payk.

H. obscurus, Sturm, = H. umbrosus, Steph.

These three species are dwellers in peat-bogs, and mossy holes, on wild elevated moors; I found all three in company, this last season, when in Cumberland at the latter end of July. *H. Gyllenhalii* is very rare; *tristis* and *obscurus* are more abundant, but by no means common. I have also taken them in similar localities in this district, but more sparingly. *H. obscurus* varies considerably both in size and colour, some specimens being almost minute.

H. memnonius, Nicolai. This variable insect is common with us, and appears to adapt itself to a great range of habitat, being found equally abundantly in ponds, ditches, streams, wells and horse-troughs. I sometimes fancy that the specimens from clear water are the most brightly coloured.

H. angustatus, Sturm, = *H. tristis, Steph.* Likewise common in our district, frequenting, by preference, the foulest ponds and ditches.

H. umbrosus, Gyll. = *H. minutus, Steph.* This, one of the most obscure, is one of the most local of our *Hydropori*. I met with it at Gosforth, where it frequents an extensive pond, which is almost choked up with *Equiseta* and other aquatic plants.

I have often noticed how exceedingly local are some insects in their distribution; and, in this instance, so much so, that I was strongly impressed with the necessity of examining every portion, however unpromising, of our hunting-ground. Though I had dredged all the likely and many unlikely ponds in the vicinity, yet had I always shunned this particular one; for having once or twice dipped my net into it in passing, such was its filthy condition, that I always shook out the unexamined contents with disgust. However, one day, in a very wet season, not being able to make progress elsewhere, from the damp state of the woods, I paid it a visit, and finding it clearer than usual, from being brim-full, I tried my net, and at the very first haul secured insects that I had in vain sought for elsewhere. After this, it scarcely need be mentioned, that I worked with a will, and finally came home richer by nearly a dozen species, every one of which was an addition to our local Fauna.

H. granularis, Fab. Not uncommon in one or two places in the district, where it is found in ditches accompanied by *H. pictus*.

H. geminus, Fab. This is one of our rarest species, and confined to one locality, where it is found very sparingly.

THOS. JNO. BOLD.

Angas' Court, Bigg Market,
Newcastle-on-Tyne, December 27, 1853.

Capture of an Aphodius in Cumberland new to the British Fauna.—In the month of August, 1852, a friend and myself made an excursion to Cole Fell, in Cumberland, hoping to meet with some of the insects dwelling in such elevated regions; but the day being sunless, the wind high, and accompanied by a drizzling rain, we were to a considerable extent unsuccessful. However, under cover of our umbrellas, we managed to pick up a fine series of *Aphodius Lapponum*, *Gyll.*, of all shades of colour, from red to jet black, and three specimens of *Aph. alpinus*, *Scop.*, *Erichs.*, = *A. rubens*, *Dej.*, *Muls.*, = *A. dilata*, *Heer.*; a species, I believe, not hitherto taken in this country.—*Thos. Jno. Bold*; *Angas' Court, Bigg Market, Newcastle-on-Tyne, December 7, 1853.*

Capture of Gracilia minuta near Sunderland.—My friend, Mr. Wm. Peacock, has taken a pair of the exceedingly graceful *Gracilia minuta*, *Fab.*, so far North as Sunderland; one of which he has kindly added to my collection. It forms a welcome addition to our local Fauna.—*Id.*

Re-occurrence of Bembidium Schuppelii in Cumberland.—Since recording the occurrence of *Bembidium Schuppelii* (*Zool.* 3289), I have taken, in August, 1852, another specimen; and a friend, whom I directed to the locality, procured no less than a dozen in the latter end of May last. In July, I carefully searched the same ground, without seeing even the shadow of a *Bembidium*; perhaps, like the greater part of the genus, it is most abundant during the spring months.—*Id.*

Catalogue of Coleoptera found in the Neighbourhood of Dublin.

By A. R. HOGAN, Esq.

(Continued from page 4136).

<i>Cercyon depressum</i> , <i>St.</i>	Sea-coast, Bal-	<i>Ephistemus gyrinoides</i> , <i>Mm.</i>	Malahide.
doyle, &c.		„ <i>confinis</i> , <i>St.</i>	Ditto.
„ <i>littorale</i> , <i>Gyl.</i>	With the former.	<i>Leiodes ferrugineus</i> , <i>Schmidt.</i>	Local.
„ <i>obsoletum</i> , <i>Gyl.</i>	Local.	„ <i>thoracica</i> , <i>St.</i>	Portmarnock.
„ <i>hæmatorrhous</i> , <i>Gyl.</i>	Roebuck.	„ <i>pallens</i> , <i>St.</i>	Local.
„ <i>laterale</i> , <i>Gyl.</i>	Local.	„ <i>picea</i> , <i>Ill.</i>	Ditto.
„ <i>unipunctatum</i> , <i>L.</i>	Dunghills;	„ <i>areolaria</i> , <i>Ste.</i>	North Bull.
flies about in warm spring days.		<i>Colenis dentipes</i> , <i>Gyl.</i>	Local.
„ <i>quisquilius</i> , <i>L.</i>	Roebuck.	<i>Clambus Armadillus</i> , <i>Deg.</i>	Malahide.
„ <i>melanocephalum</i> , <i>L.</i>	Portmar-	„ <i>Enshamensis</i> , <i>St.</i>	Ditto.
nock.		<i>Corylophus cassidoides</i> , <i>Mm.</i>	Ditto.
„ <i>anale</i> , <i>Pk.</i>	Local.	<i>Ptomaphagus truncatus</i> , <i>Ste.</i>	Sea-coast.
„ <i>Boletophagus</i> , <i>Mm.</i>	Moist pla-	<i>Catops sericeus</i> , <i>F.</i>	Dodder banks, Port-
ces, in moss, &c.			marnock, &c.
„ <i>atomarium</i> , <i>F.</i>	Roebuck.	„ <i>tristis</i> , <i>Pz.</i>	Ditto.
<i>Sphæridium scarabæoides</i> , <i>F.</i>	Common.	„ <i>Morio</i> , <i>F.</i>	Ditto.
„ <i>marginatum</i> , <i>F.</i>	Ditto.	„ <i>angustatus</i> , <i>F.</i>	Moist places, roots
<i>Phalacrus æneus</i> , <i>Ill.</i>	Dodder banks.		of trees, &c.
„ <i>corticalis</i> , <i>Schön.</i>	Taken by	<i>Necrophorus humator</i> , <i>F.</i>	Rather scarce.
Miss M. Ball.		„ <i>vespillo</i> , <i>L.</i>	Common.

- Neocrophorus ruspator*, *Er.* Taken by the late Mr. Tardy.
 „ *mortuorum*, *F.* Ditto.
Oiceoptoma rugosa, *L.* Abundant.
Silpha opaca, *L.* Portmarnock.
 „ *quadripunctata*, *Ste.* The Dargle.
Phosphuga atrata, *L.* Not common.
 „ *subrotundata*, *Mm.* Everywh.
Nitidula grisea, *L.* Kilruddery &c., on bones.
 „ *depressa*, *L.* Ditto.
 „ *discoidea*, *F.* Ditto.
 „ *æstiva*, *L.* On flowers of hawthorn, *Umbelliferæ*, &c.
 „ *silacea*, *Hbst.* Ditto.
 „ *pusilla*, *Ill.* Ditto.
 „ *obsoleta*, *F.* Ditto.
 „ *bipustulata*, *F.* Local.
Meligethes viridescens, *F.* On flowers of *Sinapis*, &c.
 „ *æneus*, *F.* Ditto: var. *cæruleus*, *Mm.*, also occurs.
 „ *pedicularius*, *Gyl.* Ditto.
Cateretes Urticæ, *F.* Not unfrequent.
 „ *pedicularius*, *L.* Ditto.
Cychramus luteus, *F.* Local.
Micropeplus porcatus, *Pk.* Portmarnock.
 „ *staphylinoides*, *Mm.* Ditto.
Trichopteryx fascicularis, *Er.* Duncannon.
 „ *grandicollis*, *Er.* Ditto.
 „ *sericans*, *Heer.* Ditto.
 „ *curtus*, *Alib.* Ditto.
 „ *Kunzei*, *Heer.* Ditto.
Anisarthria pusilla, *Gyl.* Malahide.
 „ *apicalis*, *Gyl.* Local.
 „ *punctata*, *Gyl.* Sea-coast.
Atomaria phæogaster, *Mm.* Local.
 „ *mesomelas*, *Hbst.* Ditto.
 „ *nigriventris*, *Ste.* Ditto.
 „ *fuscipes*, *Gyl.* Ditto.
 „ *atra*, *Hbst.* Ditto.
 „ *basella*, *Ste.* Baldoyle.
Mycetæa hirta, *Mm.* Not unfrequent.
Sylvanus Surinamensis, *Ste.* In sugar-stores, &c.
Latridius lardarius, *Deg.* Local.
 „ *transversus*, *Ol.* Ditto.
 „ *minutus*, *L.* Ditto.
- Corticaria pubescens*, *Ill.* On walls and windows.
 „ *gibbosa*, *Hbst.* Ditto.
 „ *ferruginea*, *Mm.* Ditto.
Byturus tomentosus, *Deg.* (B. Rosæ, *Scop.* 1763). Local.
Typhæa fumata, *L.* Roebuck.
Cryptophagus scanicus, *L.* Dublin, on walls, windows, &c.
 „ *fumatus*, *Gyl.* Local.
 „ *Ulicis*, *Ste.* Phoenix Park, abundant.
 „ *Abietis*, *Pk.* Malahide.
Antherophagus pallens, *L.* Local.
Monotoma picipes, *Pk.* Merriem.
Anommatus obsoletus, *Shuck.* Rochestown, in decayed potatoes, by Mr. Molloy.
Rhizophagus ferrugineus, *Pz.* Mount-Merriem demesne.
Trogosita Mauritanica, *L.* Local.
Dermestes lardarius, *L.* Taken by Mr. Tardy.
Attagenus pello, *L.* Lumber-rooms &c., common.
-
- Byrrhus pilula*, *L.* Local.
 „ *varius*, *F.* Portmarnock &c., on grass.
Simplocaria semistriata, *F.* Ditto.
Hister cadaverinus, *Pk.* Common.
 „ *carbonarius*, *Pk.* Ditto.
 „ *purpurascens*, *Pk.* Taken by Mr. Tardý.
 „ *bimaculatus*, *L.* One specimen in Hume St., Dublin.
Onthophilus striatus, *F.* Roebuck, &c., not common.
Saprinus rotundatus, *Pk.* Portmarnock.
 „ *nitidulus*, *F.* Ditto.
 „ *dimidiatus*, *Pk.* Ditto.
 „ *æneus*, *F.* Local.
Typhæus vulgaris, *Ste.* A dead specimen at Killiney; of frequent occurrence in Co. Wicklow.
Geotrupes stercorarius, *L.* Scarce; the var. (?) *foveatus*, *Mm.*, is, however, abundant about Roebuck, &c.

- Geotrupes putridarius*, *Br.* Local.
 „ *sylvaticus*, *F.* Ditto.
Aphodius erraticus, *L.* Phoenix Park,
 rare.
 „ *fossor*, *L.* Roebuck, &c.
 „ *scybalarius*, *F.* Not uncommon.
 „ *foetens*, *F.* Ditto.
 „ *finetarius*, *L.* Frequent.
 „ *ater*, *Deg.* Roebuck.
 „ *sordidus*, *F.* Ditto; very rare.
 „ *merdarius*, *F.* Portmarnock.
 „ *prodromus*, *Brahm.* Abundant
 „ *contaminatus*, *Hbst.* Ditto.
 „ *rufipes*, *L.* Little Dargle, &c.
 „ *depressus*, *Kug.* Phoenix Park
 „ *marginalis*, *Ste.* Common.
Egialia globosa, *Ill.* Portmarnock.
Serica brunnea, *L.* Dodder banks.
Melolontha vulgaris, *F.* Near Rathfarn-
 ham; but I have not heard of its
 being found of late years.
Phyllopertha horticola, *L.* On wild roses
 in flower.
Adrastus limbatus, *Thbg.* Not unfreqnt.
Dolopius marginatus, *L.* Ditto.
Agriotes obscurus, *L.* Ditto.
 „ *lineatus*, *L.* Ditto.
Limonius cylindricus, *Pk.* Taken by Mr.
 Tardy.
Agrypnus murinus, *L.* Local.
Hypolithus riparius, *F.* Ditto.
Cryptohypnus tetragraphus, *Germ.* Dod-
 der banks.
Ctenicerus tessellatus, *L.* Taken by Mr.
 Tardy.
 „ *cupreus*, *F.* On long grass in
 meadows, but does not appear every
 year.
Aplotarsus testaceus, *F.* Local.
 „ *rufipes*, *F.* Taken by Mr.
 Tardy.
Athous hæmorrhoidalis, *F.* Abundant.
 „ *hirtus*, *Hbst.* Local.
Cardiophorus testaceus, *F.* Ditto.
Atopa cervina, *L.* Somewhat local, and
 uncertain in its appearance.
Scirtes hemisphericus, *L.* Taken by Mr.
 Tardy.
- Cyphon pallidus*, *F.* Taken by Mr. Tardy.
 „ *marginatus*, *F.* Local.
 „ *griseus*, *F.* Ditto.
 „ *lividus*, *F.* Taken by Mr. Tardy.
Lampyris noctiluca, *L.* Taken near Cas-
 tle Knock, by M. J. O'Kelly, Esq.
Telephorus pellucidus, *F.* Not common.
 „ *bicolor*, *F.* Ditto.
 „ *flavilabris*, *Fall.* Roebuck &c.
 „ *thoracicus*, *Ol.* Local.
 „ *nigricans*, *Mlr.* Ditto.
Podabrus alpinus, *Pk.* Ditto.
Ragionycha melanura, *L.* Exceedingly
 abundant.
 „ *pallida*, *F.* Local.
 „ *testacea*, *L.* Taken by Mr.
 Tardy.
Malthinus biguttatus, *L.* Local.
 „ *brevicollis*, *Gyl.* Portmarnock.
 „ *minimus*, *L.* Taken by Mr.
 Tardy.
Necrobia quadra, *Mm.* Local.
Ptilinus pectinicornis, *L.* College Park.
Ptinus fur, *L.* Local.
 „ *crenatus*, *F.* Ditto.
 „ *hololeucus*, *Fald.* Common.
Anobium castaneum, *Kug.* Taken by Mr.
 Tardy.
 „ *striatum*, *Ol.* Abundant.
Ochina Hederæ, *Mlr.* Dunsink.
Cis Boleti, *Scop.* In Boleti on trees.
 „ *nitidus*, *F.* Not common.
- Tomicus micrographus*, *L.* Bray.
Hylastes ater, *Pk.* Near Rathfarnham;
 very rare.
Cossonus Tardii, *Cts.* Not nearer than
 Powerscourt.
Mecinus pyraæter, *Hbst.* Portmarnock.
Gymnaëtron noctis, *Hbst.* Not common.
Cionus hortulanus, *Mm.* By Mr. Tardy.
Calandra granaria, *L.* Corn stores.
 „ *Oryzæ*, *L.* Ditto.
Nedyus assimilis, *Pk.* Local.
 „ *pollinarius*, *Forst.* On nettles.
 „ *trogodytes*, *F.* Baldoyle.
Ceutorhynchus Erysimi, *F.* Local.
 „ *contractus*, *Mm.* Ditto.

- Centorhynchus Quercus*, *F.* Ditto.
 „ *didymus*, *Hbst.* Ditto.
 „ *sulcicollis*, *Gyl.* Portmarnock.
 „ *subrufus*, *Hbst.* Taken by Mr. Tardy.
Tychius picirostris, *F.* Portmarnock.
Rhinonchus Castor, *F.* Local.
 „ *pericarpus*, *F.* Ditto.
 „ *quadrituberculatus*, *F.* Ditto.
 „ *quadricornis*, *Gyl.* Ditto.
Orthochaetes setiger, *Germ.* Portmarnock.
Orchestes Quercus, *L.* Local.
 „ *Alni*, *L.* Ditto.
 „ *Fagi*, *L.* Glasnevin Botanic Gardens.
 „ *Rusci*, *Hbst.* Taken by Mr. Tardy.
 „ *Salicis*, *L.* Local.
 „ *saliceti*, *F.* Glasnevin.
 „ *stigma*, *Germ.* Not common.
Balaninus Brassicæ, *F.* Ditto.
 „ *brunneus*, *Mm.* Rare.
Anthonomus Ulmi, *Deg.* Glasnevin Botanic Gardens.
 „ *pomorum*, *L.* Not common.
Hydronomus Alismatis, *F.* Ditto.
Grypidius Equiseti, *F.* Bray Commons, in meadows.
Pachyrhinus leucogaster, *Mm.* Local.
Notaris acridulus, *L.* Ditto.
Eirrhinus schirrhosus, *Schön.* Ditto.
Dorytomus Tortrix, *L.* Ditto.
 „ *pectoralis*, *Pz.* Taken by Mr. Tardy.
Hypera punctata, *F.* Dundrum, &c.
 „ *murina*, *F.* Portmarnock.
 „ *nigrirostris*, *F.* Ditto.
 „ *Plantaginis*, *Deg.* Taken by Mr. Tardy.
 „ *Rumicis*, *L.* Ditto.
Elleus bipunctatus, *L.* Ditto.
 „ *scanicus*, *Pk.* Portmarnock.
Leiosoma ovatula, *Clv.* Not common.
Tanyphyrus Lemnæ, *Pk.* Rathfarnham.
Alophus triguttatus, *F.* Portmarnock.
Barynotus mercurialis, *F.* Frequent.
Merionus elevatus, *Mm.* Ditto.
- Merionus obscurus*, *F.* Frequent.
Liophlæus nubilus, *F.* Generally distributed.
Otiorynchus sulcatus, *F.* Local.
 „ *singularis*, *L.* Ditto.
 „ *rugifrons*, *Gyl.* Sandycove.
 „ *tenebriosus*, *Hbst.* Baldoyle, on hedges.
 „ *atro-apterus*, *Deg.* Malahide and Portmarnock.
 „ *scabrosus*, *Mm.* Near Dundrum.
 „ *ovatus*, *L.* Local.
 „ *niger*, *F.* Ditto.
 „ *brunnipes*, *Ol.* Roebuck, &c.
Trachyphlæus scabriculus, *L.* Taken by Mr. Hardy.
Molytes anglicanus, *Mm.* Portmarnock, rare.
Philopodon geminatus, *F.* Ditto.
Strophosomus Coryli, *Schön.* Local.
Sciaphilus muricatus, *F.* Ditto.
Sitona Regensteinensis, *Hbst.* Ditto.
 „ *hispidula*, *F.* Ditto.
 „ *lineata*, *L.* Common.
 „ *canina*, *Gyl.* Local.
 „ *grisea*, *F.* Ditto.
 „ *tibialis*, *Hbst.* Ditto.
 „ *lineella*, *Bonsd.* Portmarnock.
 „ *fusca*, *Ste.* Baldoyle, &c., abund.
 „ *subaurata*, *Kby.* Ditto.
Polydrusus flavipes, *Deg.* Glasnevin Botanic Gardens, &c., scarce.
 „ *micans*, *F.* Taken by Mr. Tardy.
 „ *pterygomales*, *Schön.* Upon beech-trees, early in summer.
Nemoicus oblongus, *L.* Local.
Phyllobius uniformis, *Mm.* Ditto.
 „ *argentatus*, *L.* Frequent.
 „ *calcaratus*, *F.* Taken by Mr. Tardy.
Apion Cracæ, *L.* Bray.
 „ *violaceum*, *Kby.* Local.
 „ *Hydrolapathi*, *Kby.* Ditto.
 „ *frumentarium*, *L.* Ditto.
 „ *radiolus*, *Kby.* Ditto.

Apion æneum, <i>F.</i> Portmarnock.	Apion miniatum, <i>Schön.</i> Malahide, &c.
„ Carduorum, <i>Kby.</i> Local.	„ subulatum, <i>Kby.</i> Not common.
„ rufrostre, <i>F.</i> Ditto.	„ vorax, <i>Hbst.</i> Ditto.
„ virens, <i>Hbst.</i> Portmarnock, abundant.	„ Ervi, <i>Kby.</i> Ditto.
„ Kirbii, <i>Ste.</i> Phoenix Park.	„ assimile, <i>Ste.</i> Local.
„ flavipes, <i>F.</i> Local.	Ramphus flavicornis, <i>Clv.</i> Phoenix Park, on hawthorn.
„ nigrিতarse, <i>Kby.</i> Ditto.	Rhynchites Alliariz, <i>Pk.</i> Taken by Mr. Tardy.
„ apricans, <i>Hbst.</i> Not unfrequent.	„ Betulæ, <i>L.</i> Ditto.
„ Pisi, <i>F.</i> Local.	

(To be continued).

A. R. HOGAN.

Charlton, Dundrum, near Dublin,
January, 1854.

The Cholera Fly.—Something has been said at the meetings of almost every Natural-History Society, on a small fly (*Aphis Rumicis*), which appeared in vast swarms during the past autumn, in those districts of the North of England which have been stricken with that fearful scourge, the cholera. No notice has, I believe, been previously taken of the occurrence of this fly at the time when the cholera has been raging; I therefore think that the following may be interesting. In 1833, when this plague was at its height in Exeter, the very same thing happened. As I was then only just out of my long clothes, my own entomological recollections will not carry me so far; but years and years ago my mother has told me that at that time vast swarms of very minute flies suddenly passed over the city like misty clouds, and darkened the air, even in the brightest sunshine. On these occasions, any meat that might be exposed in the air, became immediately putrid. My mother, on seeing these clouds approach, always ordered the windows to be closed; and by that means, she believed, kept off the cholera from the house. Whether this fly has anything to do with the cause of the disease; whether it always accompanies the malaria without being the direct cause; or whether it be simply an accidental circumstance resulting from the favourable state of the atmosphere at the time for their development, are questions which further observation, or, at any rate, heads wiser than mine must decide. At the same time, I will just observe, that if the fly be the cause of the cholera, the diminution of the disease, which has always taken place during the winter months, would in a great measure be accounted for, since the insects would then be destroyed by the cold; while if, on the contrary, cholera were caused solely by noxious vapours proceeding from insufficient drainage &c., I think that that evil would be rather aggravated than otherwise, at a time when the weight of the atmosphere prevents those gaseous particles from dispersing. Again, can any one say what is the origin of cholera? Alas! they cannot; if they could, we might hope that some remedy would be found. Whatever be its origin, it must be agreed that it is some ingredient of the atmosphere, borne along with greater or less rapidity through whole countries or continents. Wherever cholera breaks out, some foreign nucleus has been imported into the district, the development of which is of greater or less extent, depending on certain secondary conditions,

namely, the absence or presence of damp, cleanliness, efficient drainage, wholesome food, &c. May not that nucleus consist of these minute flies or their eggs? Many circumstances which might be mentioned seem to favour such a supposition.—*Alfred Merle Norman; Clevedon, Somerset, December 14, 1853.*

Proceedings of Natural-History Collectors in Foreign Countries.

MR. H. W. BATES.* — “Santarem, May 27, 1853.—1454 Coleoptera and various insects, contained in two boxes; and the imperfect skin of a sloth. The above go down to Pará by the steamer, and I hope will reach you safely. The season was rather peculiar this year, the dry weather having been prolonged to the end of February, and when the rains *did* come, they were incessant till now; therefore the “insectiferous” showery gleamy season has been almost *nil*. However, I applied myself closely and laboriously to the minute Coleoptera, and hope the present collection will be considered a good result of my labours so far. It appears to me that by far the greater portion I have not sent you before, and are probably new to science. There is a wonderful amount of various and curious things in the Staphylini, Geodephaga, Anthici, &c. I have had great difficulty in keeping them free from mould, but find they will require only a little careful brushing to become good specimens. I have gummed them lightly on card, so that purchasers can have no difficulty in taking them off with the point of a moistened hair pencil, and setting them as they wish: as to packing them in pill-boxes, I am sure it won’t do in the wet season here, for even when previously dried in trays, they are sure to become a mass of mould in a fortnight in the pill-boxes. Besides, I like better to have them displayed, because I can then note the species, and be guided in collecting, so as not to miss similar-looking things. I see the small Coleoptera are much studied on the continent; there are many almost exclusively “Staphylini-men,”—Erichson, Mannerheim, D’Aubé, &c.; others “Anthici-men,”—Marquis La Ferté, Dr. Schmidt, &c.; others, small Geodephaga,—Chaudoir of Moscow, &c. I have put a number to many species, some of which refer to the notes inclosed; the species having numbers I have selected almost at random, numbering only as many as I have time to bestow on. I want you to give me a list of all the numbered species (or as many as you can), with any information you can get about each,

* Communicated by Mr. S. Stevens.

such as the name of the genus if not of the species, whether a favourite group or not, whether new or not.

"The Upper Amazon steamer has not arrived yet: I rather expect I shall be obliged to go to Parà after all to embark, as it is probable it will not stop here; but I can get no news of the Company's plans: if it stops at the Barra, of course I can go thither in the Barra steamer and tranship. At any rate, there will be time to receive books and papers from England. Odd papers, magazines, &c., which many entomologists circulate amongst their friends, if relating to South-American insects, even if in German, I should esteem much.

"I am very anxious to hear of the safe arrival and profitable sale of the barrel of fishes, &c. I could do more, perhaps, than you expect in London, in fishes, as I believe there are *thousands* of species in these rivers, and those of the brooks and head rivers are different from those of trunk streams: I only want encouragement. There is some difficulty about vessels for them; good barrels are not to be had: but I have a scheme to remedy this. I have got some news of the *Lepidosiren* at last; the Indians call it "*Tambaki-mboya*," and I have some friends on the look-out for it: it is only with bow and arrow that they can obtain it, as they say it bites off the hook. I think it likely I may get heads of the *Inia*, or dolphins; yet the Indians have superstitions about them which makes it difficult to get them. All say there are three kinds; I have always seen two, the *Bouti* and the *Tucuxi*, the former have some black and the others flesh-colour, and as I have seen these colours go in pairs when they are rolling, they may be two species. The sloth I send was a fine specimen, but most unfortunately, such is the humidity of the weather, it was impossible to dry it quickly enough, and the claws all fell off. In future, I shall treat all thick mammal-skins as Professor Owen recommends in the Admiralty Manual—put them in spirit.

"I think it is necessary that you should request Messrs. S. & Co., when you send parcels, to put them in their manifest; likely enough the lost parcel was seized in Parà for want of this. There is now steam all the way from Southampton to Santarem; you might try this conveyance by sending me the six latest dates of the '*Illustrated London News*,' they will reach me in about thirty-five days."

"Santarem, June 26, 1853. — I wrote you when I forwarded a collection on the 10th of March; a second letter on the 29th of March; and a third with the collection on the 27th of May; so, having written so often, I have not at present much to say. The steamer, when

it came up, brought me letters from you, which contained the pleasant intelligence of the safe arrival of the Tapajos collection, which had begun to cause me some uneasiness. The collection appears to be considered one of the best, as I had expected. There are many beautiful things still left with me, but only as unique at present, especially in Eurygonæ, &c. The estimation bestowed on my miserable specimens of Economic Botany is very encouraging, and I value Mr. Hanbury's notice and politeness: as to the offer mentioned, I cannot conscientiously say that the prices given are not liberal or sufficient, at the same time, of course, the more encouragement I receive the harder I work, and I have already a few specimens collected since the receipt of the letter. I would rather say, that as my application to this department is dependent on my future stay and further exploration of the country, the present of a periodical, or literary and scientific journal, to make me feel less an exile from intellectual society, would be very acceptable. The journal need not be new, second-hand will do. I would name the 'Art Journal,' or even the 'Illustrated News;' my brother already sends me the 'Athenæum.' When you send me the next parcel of books, I hope the 'Zoologist' will not be forgotten; send all the numbers.

"Considering the value of the Tapajos collection, the non-arrival of the steamer for the Upper Amazons, &c., I shall adopt your advice and make another visit; in fact, I am now preparing. I shall not hire a canoe and hands, indeed the latter is impossible; even the two mulattoes I engaged last time cannot now be had, as one has been in prison for burglary, and the other is at Obydos. I shall make use of some of my friends to give me a lift to Alter do Chao, as the first station. All letters and parcels will reach me safely.

"H. W. BATES."

Occurrence of the Round-headed Porpoise (Phocæna melas) near Ventnor.—A specimen of the round-headed porpoise, or caaing whale (*Phocæna melas*, Trill), is now lying on the shore below Hoody Point, about a mile and a half from this place. It was washed ashore on the night of Sunday, the 25th instant; yesterday I proceeded to the spot, and having made a rough sketch, readily identified it as the above species on reference to Professor Bell's work. The following dimensions were obtained with the aid of a walking-stick:—Length, 15 feet 6 inches; depth, 3 feet 8 inches; length of pectoral fin, 3 feet; dorsal ditto, 2 feet 8 inches; width of caudal fin slightly exceeding 3 feet; the circumference might exceed 8 feet. The white mark under the throat was very small, not extending along the breast and belly as described; moreover, the width of the flukes I made 1 inch more than the length of the pectorals,

instead of falling short of it. With these exceptions, the description exactly applied. It appeared to be a male, of less than the average size: the blubber, a portion of which had been removed, was about $1\frac{1}{2}$ inch in thickness. I was anxious to carry off a tooth, but though they appeared loose, being provided only with a pen-knife and Adams's forceps, could not effect it.—*George Guyon; Ventnor, Isle of Wight, December 28, 1853.*

*Extracts from Letters of JOHN WOLLEY, Esq., now in Lapland.**

*NOTE on the Habits of the Hawk Owl, (Surnia ulula).—*So little is known respecting the appearance while living, and the habits, of this rare visitor to Great Britain, that I feel sure the following account of it, written from Lapland by Mr. John Wolley, will be interesting to the readers of the 'Zoologist.' It is necessary to observe, that it labours under the disadvantage of not having been originally intended for publication, and also of not having been seen by the writer since I obtained his permission to make the present use of it.

"The hawk owl is not uncommon here. It flies much in the daytime, and with its long tail, short wings, and quick flight, has a very hawk-like appearance in the air, when its large square head is not seen. Its cry near its nest is also similar to a hawk's; and it often sits on the bare top of an old dead fir, to watch intruders, where it seems to have no idea that it can be in danger. It carries itself much after the fashion of the more regular owls; but whilst all the feathers at the back give a great breadth to its full face, there is quite a 'table' at the top of its head. It casts its bright yellow eyes downwards with the true air of half-puzzled wisdom, or turns its head round for a leisurely gaze in another direction; to glance backwards is out of the question, and to look at any one with a single eye much beneath its dignity. I have seen it from my window fly down from its stand and take the mouse it caught back to the tree before it began to eat it; but it shifted its place several times before it found a convenient spot for finishing the meal. I do not know whether it is in the habit of hunting on the wing, but this year mice are so abundant that such exertion would be superfluous. When disabled from flight, it at once 'squares' itself for defence, putting on its most formidable countenance, guarding its back, and presenting its front to the enemy; silently and calmly it maintains its ground, or springs from a short

* Communicated by Alfred Newton, Esq.

distance on its foe. So, bravely it dies, without a thought of glory, or without a chance of fame, for of its kind there are no cowards.

"One day I heard a low noise in the woods which surprised me. I thought it must be the whine of a dog that was very eager after some animal it could not get at; I even guessed it might be a wolf. After a careful stalk I came upon a family of hawk owls, one of which dropped a mouse as I fired. It was in the day-time; they were very little alarmed, and I could have shot them all. I am told that they breed in 'tyllyrs.' I have not found a nest, but shall set up some convenient houses for them this autumn."

"Tyllyrs" are the nest-boxes set up by the Lapps and other inhabitants of the far North for the accommodation of the golden-eyed duck, or rather for their own, as it is a case of "*Sic vos non vobis*." Is this the species of owl of which Linneus (as may be seen in Yarrell's 'British Birds,' iii. 270) found a couple of young ones hung up *in terrorem*, in consequence of their parents having appropriated a box to themselves?

Egg and Song of the Redwing (*Turdus iliacus*).—Some time since several very interesting notes respecting the colour of the egg of the redwing appeared in the 'Zoologist' (Zool. 2141, 2948, 2983, 2984), and all but conclusive evidence was then adduced by Mr. Wilmot and Mr. John Wolley; in case, however, any one should still entertain a lingering doubt as to its true character, I beg to record, for their complete satisfaction, that I am informed by my friend, the gentleman last named, that on May 23rd, 1853, he shot a redwing near Umea, in the North of Sweden, containing an egg, perfect, and ready for exclusion; and that this egg, which (together with all the others collected by him last year in Scandinavia) is now in my keeping, closely resembles those which collectors have been accustomed to receive from Mr. Procter, and other trustworthy sources: that is to say, it is of the same character as eggs of the blackbird, and is in no way like ordinary varieties of eggs of the song thrush. In addition to those particulars respecting the nidification of the redwing furnished to the new edition of Mr. Hewitson's 'Eggs of British Birds,' Mr. Wolley tells me he is assured that it does not breed near Stockholm, or in the southern or central parts of Sweden; and hence the difficulty there has hitherto been in procuring its eggs from that country. He goes on to say:—

"When they have young, the old redwings are bold, flying suddenly towards the face of an intruder with an angry note, something

like that of the blackbird, snapping their beaks, and then wheeling rapidly out of sight. At other times, they use the same note as they fly from tree to tree round the nest, but they keep out of sight as much as possible. As she sits on her eggs, the white stripe over the eye of the redwing is very conspicuous. Like other birds of the kind, she has so deep a cup to hold her that the rim of it necessarily chucks her under the chin, and makes her beak point upwards.

"The redwing and the redstart sing here [Tornea Lapmark] all night; the redwing incessantly, night and day, without any variation. A string of three or four notes—*tut-tut-tut*—in a regular descending scale, and then a little inward twittering or warbling, the former at about the ordinary pitch of the voice of the song thrush (whose music, by the way, is infinitely superior), but the last part so faint and feeble as scarcely to amount to a whisper, and only to be heard at a short distance. For a long time I was not aware of the existence of this inward melody: perhaps the twittering of a swallow on the house-top may give some little idea of it. The *tut, tut, tut* is repeated so constantly and regularly as to be quite tiresome, the rest seldom reaches the ear; nevertheless, these loud clear notes, followed at the end of the next interval by the suppressed scarcely distinguishable twitterings, make a very striking wood-sound. I much question whether it is ever to be heard in perfection before the bird leaves our islands. The inward kind of song I think I have heard up here very late in the year, but unprecedented by the bold open notes, and unfollowed by a repetition of them after a very short rest, as in the perfect spring song, which I heard for the last time this year about July 27th."

It is plain that Mr. Wolley does not think that this bird is entitled to the name of "Swedish nightingale;" I have therefore given the above long though interesting extracts from his correspondence.

ALFRED NEWTON.

Elvedon, Thetford, January 6, 1854.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

January 2, 1854.—EDWARD NEWMAN, Esq., President, in the chair.

Donations to the Library and Museum.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for January; by the Editor. The 'Athenæum' for December;

by the Editor. The 'Literary Gazette' for December; by the Editor. The 'Journal of the Society of Arts,' for December; by the Society. Hewitson's 'Exotic Butterflies,' Part 9; by W. W. Saunders, Esq. 'Verhandlungen des zoologisch-botanisch Vereins in Wein,' 1 Band. Wein, 1852; by the Society. 'Entomologische Zeitung,' October to December, 1853, and for 1853, complete. 'Linnea Entomologica,' viii. Band. Berlin. 1853. 'Beitrage zur nähern Kenntniss von Periplaneta (Blatta) orientalis, Linné;' von C. Cornelius; Elberfeld; all by the Entomological Society of Stettin. 'Report of the Council of the Art Union of London for 1853,' and 'Almanac for 1854;' by the Art Union. Two pairs of *Lælia cænosa*; by Mr. Foxcroft. Fifty specimens of butterflies; by T. J. Stevens, Esq., Bogota, Corr. M. E. S. A box of British Micro-Lepidoptera; by P. H. Vaughan, Esq.

Death of Mr. Thomas Whitfield.

It was announced that Mr. Thomas Whitfield, well known as a zoological collector in Africa, and whose exertions, during thirty years, added many rare animals to the collection of the late Earl of Derby, the British Museum, &c., died in London, on the 25th of December last.

Election of a Subscriber.

Miss S. Thompson, Barn Hill, near Stamford, was elected a Subscriber to the Society.

Exhibitions.

Mr. S. Stevens exhibited some butterflies received by him from Mr. T. J. Stevens, of Bogota, among them a couple of the rare and beautiful *Morpho Ganimede*, *Westwood*, (*M. Sulskowskii*, *Kollar*). One of them being quite spoiled by grease when it arrived, was immersed for twenty-four hours in camphine, and then magnesia having been applied, it was restored to its original brilliancy, so that no one could tell which of the two had been greasy. He also exhibited a few butterflies from Manilla, whence very few are obtained in this country.

Method of taking Honey from Beehives in China.

Mr. Westwood handed the following extract from the 'Gardener's Chronicle,' to which journal it was communicated by Mr. R. Fortune:—

"I am staying at present (August 16th) in a Buddhist temple, situated in a most romantic and beautiful spot amongst the tea-hills in the province of Chekiang. Some of the priests in this temple are fond of bees, or it may be they are fonder of the honey, and keep a number of hives. The Chinese hive is a very rude affair, and a very different looking thing from those we are accustomed to use in England, and yet I suspect were the bees consulted in the matter they would prefer the Chinese one to ours. It consists of a rough box, sometimes square and sometimes cylindrical, with a movable top and bottom. When the bees are put into a hive of this description it is rarely placed on or near the ground, as with us, but is raised eight or ten feet, and generally fixed under the projecting roof of a house or out-building. No doubt the Chinese have remarked the partiality which the insects have for places of this kind when they choose quarters for themselves, and have taken a lesson from this circumstance. My landlord, who has a number of hives, having

determined one day to take some honey from two of them, a half-witted priest who is famous for his prowess in such matters was sent for to perform the operation. This man, in addition to his priestly duties, has the charge of the buffaloes which are kept on the farm attached to the temple. He came round in high glee, evidently considering his qualification of no ordinary kind for the operation he was about to perform. Curious to witness his method of proceeding with the business, I left some work with which I was busy, and followed him and the other priests and servants of the establishment to the place where the hives were fixed. The form of the hives, in this instance, was cylindrical, each was about three feet in height, and rather wider at the bottom than the top. When we reached the spot where the hives were placed, our operator jumped upon a table placed there for the purpose, and gently lifted down one of the hives and placed it on its side on the table. He then took the movable top off, and the honeycomb, with which the hive was quite full, was exposed to our view. In the meantime an old priest having brought a large basin, and everything being ready, our friend commences to cut out the honey-comb with a knife made apparently for the purpose, and having the handle almost at right angles with the blade. Having taken out about one-third of the contents of the hive, the top was put on again, and the hive elevated to its former position. The same operation was repeated with the second hive, and in a manner quite as satisfactory. But it may be asked, 'Where were the bees all this time?'—and this is the most curious part of my story. They had not been killed by the fumes of brimstone, for it is contrary to the doctrines of the Buddhist creed to take away animal life—nor had they been stupefied with a fungus, which is sometimes done at home, but they were flying about above our heads in great numbers, and yet, although we were not protected in the slightest degree, not one of us was stung; and this was the more remarkable as the bodies of the operator and servants were completely naked from the middle upwards. The charm was a simple one:—it lay in a few dry stems and leaves of a species of *Artemisia* which grows wild on these hills, and which is largely used to drive that pest the mosquito out of the dwellings of the people. This plant is cut early in summer, sun-dried, then twisted into bands, and it is ready for use. At the commencement of the operation I am describing, one end of the substance was ignited and kept burning slowly as the work went on. The poor bees did not seem to know what to make of it. They were perfectly good-tempered and kept hovering about our heads, but apparently quite incapable of doing us the slightest injury. When the hives were properly fixed in their places, the charm was put out, and my host and his servants carried off the honey in triumph. 'Come,' said he to the operator and us who were lookers on, 'come and drink wine.' 'Aye,' said the half-witted priest, 'drink wine, drink wine;' so we all adjourned to the refectory, where wine in small cups was set before us."

Mr. Curtis suggested that it might be worth trying if any of our English species of *Artemisia* would have the same effect as the Chinese.

Mr. Westwood said that a neighbour of his had turned up his hives and taken out the honey he required, smoking a cigar during the operation, without suffering any injury from the bees; but he himself had deprived hives of their honey with perfect safety, simply by drumming the bees into an empty hive, without any smoking.

Habits of Panurgus ursinus.

Mr. Curtis communicated the following note on *Panurgus ursinus*:—

"I wish to record the habits of this bee, which I observed during a visit to Tunbridge Wells.

"On the 13th of July I saw considerable numbers flying over a foot-path by the side of a heath, many of them were burrowing in the earth, and others were paired over the holes they had formed. On the 24th I again visited the same locality, when I found the females curling themselves up in the flowers of a *Hieracium*? the males flying around them. At the same time scores of the males were entering the holes in the foot-path, and occasionally I saw at the entrance a male rolling over with a female in the dust, in the act, I suppose, of copulation. In 1826, when I illustrated this genus in the '*British Entomology*,' the species were considered rare; I had, however, found *P. ursinus* not uncommon on Shooter's Hill, in August, 1819; and *P. lobatus* I detected in abundance at Black Gang Chine, Wallpan Chine, and Ventnor, in the flowers of a hawk-weed, from the end of July to the middle of August, 1826; and Mr. Smith also has lately found it in the Isle of Wight.

"I regret that I could not, from the hardness of the foot-path and for want of a proper instrument, investigate the burrows, apparently formed by these bees, and I am quite unacquainted with their metamorphoses."

Small Lepidoptera of the Amazon.

The Secretary read the following extract from a letter addressed to him by Mr. T. J. Stevens of Bogota:—"Respecting small *Lepidoptera*, there are a great many in this hot country, at least nocturnal ones, for as soon as the candles are lighted they enter into the houses; but in most parts the mosquitoes enter at the same time, and it would require a thorough-bred entomologist to collect moths under their auspices."

Papers read.

The following papers were read:—"Descriptions of some new Species of Butterflies from South America;" by W. C. Hewitson, Esq. The first part of a "Monograph of the Chrysomelidæ of Australia;" by J. S. Baly, Esq. "Some Observations on the Excrement of Insects, in a letter addressed to William Spence, Esq., F.R.S., &c.;" by John Davy, M.D., F.R.S., Inspector-General of Army Hospitals. In this paper the author records the result of many investigations into the chemical constituents of the excrement of insects of several Orders, both in the larva and adult states, remarking upon the importance of the subject with reference to the vast number and diffusion of insects, and the effect their excrement, consisting as it does of matter most powerfully stimulant to vegetable life, must have in the economy of Nature.

New Part of 'Transactions of the Entomological Society.'

A new part of the '*Transactions*' was announced as ready for distribution.—J. W. D.

ROYAL SOCIETY OF EDINBURGH.

December, 1853.—SIR THOMAS BRISBANE, President, in the chair.

There was a large attendance of scientific men—most of the Professors of the University, and others devoted to the study of physical science in Edinburgh, being present. The following papers were read:—

The Torbanehill "Mineral."

The chief business of the evening was a paper by Professor Traill, on the substance which has recently acquired extensive notoriety in legal and scientific circles throughout Europe, as the Torbanehill "mineral," previously known, it is said, as the Boghead gas coal. The President having called upon Professor Traill to read his paper, he proceeded to give a detailed account of the local situation and geological position of the mineral in question; but these did not seem to supply any evidence as to the true nature of the substance. There could be no doubt but that it occurred in a coal formation, although he considered this as no argument in favour of its being coal, as many other minerals are found under exactly similar conditions. He then gave a description of the substance, dwelling particularly upon those points which seemed to distinguish it from household coal and cannel coals; in its colour it was stated to differ, as well as in its scratch changing colour and not being lustrous. Its thin edge, when held betwixt the eye and a candle-flame, was shown to transmit light. It also possessed very considerable elasticity, causing the hammer to rebound, and differed in its fracture from ordinary coals. Specimens were handed round the room to illustrate the various statements made by the learned Professor, who also threw a block of the substance into the fire, to show that it did not burn like ordinary coal, but produced a bright flame, never going into a red heat, such as would render it suitable for the cooking of meat and other culinary operations. He also lighted a piece of it at a candle, showing that it burned freely in this way, with a bright flame, and produced a large quantity of smoke, the carbonaceous matter being deposited in part upon the piece itself. Organic structure had been traced in the substance, but he did not deem this of much importance. His various researches led him to the conclusion that it was not a coal, nor a parrot-coal, nor asphaltum, nor a bituminous shale, to which it nearly approached, but a distinct *mineral*, for which he proposed what he considered to be the most appropriate name—BITUMENITE. Professor Traill stated that this opinion had been long formed, that the mineral had been brought to him long before the celebrated trial, and that he at once recognized it as a mineral new to him and to science. We of course do not enter into the details of the appearances and peculiarities presented by the substance, as they could not be interesting to the majority of our readers; and those who, either from commercial or scientific motives, desire to acquaint themselves with the elaborate details of Dr. Traill's paper, will no doubt have an opportunity of doing so in the 'Transactions of the Royal Society,' at the close of the present session.

The President called for the opinions of members.

Professor Gregory, in remarking upon the paper, stated that he did not consider the substance in question similar to a bituminous shale, as the bitumen could not be extracted from it by any solvent with which he was acquainted. He did not see any chemical evidence for regarding it as differing from coal.

Professor Fleming, in the most spirited speech we have heard from him for a long time, contended that the substance, which he preferred to call the "Boghead gas coal," was a coal, and a candle coal. What is a candle coal? asked he, and why does it get that name? Because it burns like a candle, which *this* substance does; and what is a parrot-coal, and why does it get that name? Because in burning it makes a noise, "chatters like a parrot," and the block burned in the Royal Society's grate demonstrated that the so-called mineral did the same. He argued that Professor Traill had pointed out no characters of sufficient value whereby to

distinguish his mineral; mineralogists did not depend upon mere external characters now-a-days (Professor Traill—"They never did"), and the characters pointed out by the author of the paper did not involve differences of kind, but merely of degree. [In an after speech this was denied by Professor Traill, and he seemed to lay great stress on the external characters, which were of great practical value in distinguishing minerals, iron and copper pyrites, for example; and the only difference between the charcoal and the diamond was a difference in hardness, for their chemical composition was the same]. But Dr. Fleming, instead of acknowledging Dr. Traill's new mineral, *Bitumenite*, did not consider it a mineral at all. It was not formed of certain elements in certain proportions, but varied much in different specimens; and from these and other considerations, it was not a mineral, but a *rock*, and it did not differ more from coal than the Craighleith sandstone did from the Hailes sandstone, or the Redhall did from the Granton, or the sandstone of Salisbury Crags did from all four. In the same way, the mountain limestone of different districts presented differences equally marked with those which distinguished the Boghead gas coal from other kinds of coal. With respect to structure, he had seen specimens of fossil wood wherein the slightest trace of organic structure could not be detected under the microscope.

Professor Bennet had devoted much attention to the microscopical characters of the different coals, and wished to give his opinion merely on this point. He exhibited drawings, from the microscope, of true coal, and the substance in question. The latter exhibited markings, which he believed were regarded by the botanists engaged in the inquiry as cells. Now, they wanted the character of cells. Hugo von Mohl had shown the vegetable cell to be of the following anatomical structure:—It consisted of, 1, a central nucleus; 2, a primordial utricle; 3, a proper cell-wall; with also included granules. Now, these appearances he could not find in any specimens of the substance submitted by him to the microscope. It was of great importance, he considered, to determine whether the markings shown in his drawing were cells or not, because the whole question hinged upon it, and if they were cells, then this substance showed a structure so profuse in cells as to be unparalleled in any other instance of coal.

Dr. Greville had been called upon to examine the substance carefully, and stated that although the markings in the drawing looked very like cells, still he was not prepared to say that they were cells in their normal condition. They might have been once cells, and become altered, but, at any rate, the substance seemed to have a vegetable basis.

Professor Balfour entered at length upon the question in its botanical bearings. There could be no doubt but that organic structure, both vascular and cellular, occurred in the disputed substance. He alluded to the opinions of Quekett and others who had examined it with this view, and thought that it was wrong to draw any argument against the substance being coal, from the fact that the structure seen was not of a certain kind; coal might be formed of coniferous wood, in other cases it might not. We know well that various plants differing from the Coniferae—the *Stigmaria*s and others—occurred in the coal formations, and it was but reasonable to suppose that these contributed to the coal deposits, as well as the Coniferae. It was impossible, therefore, to set limits to the kind of structure to be found. As for finding the nuclei and primordial utricles of cells, we could not expect that. With regard to the general appearance of the substance, he also made some observations, and stated that,

so far from the Torbanehill mineral being well distinguished in this respect from some kinds of coal, he had placed specimens of it and of certain kinds of coal, side by side, before a very competent authority, who could not decide which was the one and which the other. On the whole, therefore, he was satisfied that it was vain to attempt to draw any distinction between the Torbanehill substance and coal.

The Blind Animals of the Mammoth Cave at Kentucky.

Read "A Notice of the Blind Animals which inhabit the Mammoth Cave of Kentucky." By JAMES WILSON, Esq.

The cave in question was described as of great extent, and remarkable in several respects. Although described as a "cave," it consists of innumerable extensive underground galleries, the sides and tops of which consist of limestone. The temperature of the cave is uniformly 59° Fahrenheit throughout the whole year, and a remarkable phenomenon is shown by the variation of temperature outside. When the temperature outside is higher than that of the cave, then an outward current of air is observed, its violence being proportionate to the difference of temperature. On the other hand, when the outer air falls below 59°, then a reverse current sets in. In some cases these currents are so strong as to extinguish the lamps carried by explorers. No change of temperature has, however, been on any occasion observed in the cave, a proof of its vast extent. It is completely dark, but inhabited by some animals. These inhabitants are, in most cases that have been observed, completely blind, some indeed having the rudiments of eyes, and others the eyes to *appearance* pretty well developed, but useless for the purposes of vision. Specimens of the animals were handed round, and the author of the paper detailed their characteristics and habits, as well as of all other remarkable animals in other parts of the world that are known to be without the power of vision. As blind inhabitants of the Kentucky cave, he noticed two bats, two fishes, several beetles, two rats,—one found at a distance of seven miles from daylight, some spiders, moles, Crustacea, and other animals, including the minute Infusoria, which last not being furnished with eyes in those species that live in light, were not to be expected to possess them in those that live in darkness. He alluded to the blind mole of the Cape, and also to the blind mole of Greece, which is the common mole there, and the mole of Aristotle. Aristotle was therefore correct in describing *the mole* as blind, and his correctors and commentators wrong who found eyes in the British mole, which is a different animal, possessed of the faculty of vision. He also noticed a blind reptile. The inquiry as to the origin of those remarkable beings that inhabit the Kentucky cave is full of interest. Whether their origin is coeval with the cave itself we cannot tell; it may be that they were created for the remarkable conditions which it affords. But it is also possible that they may represent unfortunate animals that had ages ago wandered into the dark recesses of the cave, and in the total absence of light, and consequent disuse of their visual organs, these organs may have become obliterated, or where their forms remain, they may have become incapable of performing their functions. In such an inquiry, the author remarked, that, like the animals themselves, we grope in the dark.

DUBLIN NATURAL HISTORY SOCIETY.

December 9, 1853.—CHARLES FARRAN, Esq., M. D., in the chair.

Donations.

Mr. Kinahan begged to present to the Society from Dr. Corrigan a fine specimen of the spiny cross-fish (*Uraster glacialis*), also Muller's topknot (*Rhombus hirtus*), both taken in Dalkey Sound; and from himself the reddish gray bat (*Vespertilio Nattereri*), captured in the county of Kildare. As Mr. Kinahan's paper would be chiefly with reference to this bat, he would not now offer remarks upon it.

Natterer's Bat.

Mr. Kinahan read a paper on the occurrence of Natterer's bat in the county Kildare; the substance of which appeared in the 'Zoologist' for September last, (Zool. p. 4012.)

List of Irish Mammals.

Mr. Kinahan made the following remarks on the Mammals of several parts of Ireland:—

"I beg to lay before you a local list of the distribution of the Mammalia of part of Carlow, Kildare, and Queen's County, for which I am indebted to the kindness of the same gentleman who gave me the bats,—F. Haughton, Esq. Pipistrelle—common; one, captured in 1853, in company with the next at Levitstown, county Kildare. Natterer's bat, nine captured June, 1853, in Tankardstown-bridge, near Levitstown, county Kildare—common, though perhaps local. Hedgehog—common. Badger—Kilmartony woods, Queen's County, rare. Otters, river Barrow—very common. Stoat—very common. Common fox—very common. Long-tailed field mouse—common; Levitstown. Common mouse—very common. Black rat—Carlow; single specimen killed. Norway rat—common everywhere. Common marten—very rare; last seen about ten years since at Bestfield, Carlow. A skin obtained at Mount Leinster, county Carlow, eighteen years since, was sent to the late Mr. Vigors by T. Haughton, Esq. Irish, or varying hare—rather rare; Oakpark. Rabbit—common. Common squirrel—very rare; existed formerly in Pollerton, county Carlow, and said still to be found in Burton Hall woods. This list, though containing but few rarities, is of importance, as all authentic local lists are valuable. It contains but four rare animals. The squirrel, concerning which many doubt its ever having been indigenous; it is said in Nulty's 'History of Dublin,' to have been found in Lattrelstown woods, near this city; and there is a tradition that they used to be found near Clondalkin. The other three rarities are—the marten, the black rat, and the badger, all of which, from various causes, are becoming more and more rare in this country. There is one remarkable omission in the list, the long-eared bat, which we might have expected to find. I made, myself, particular inquiries about it, and could get no tidings of it, so I suppose it does not exist here."

Mr. Williams and Mr. Montgomery said that they were of opinion that in the more remote districts those animals were still frequent. The badger, Mr. Williams observed, was constantly met with in parts of Kerry; and Mr. Montgomery stated that in Mayo and Donegal neither the badger nor marten was scarce.

Mr. Andrews said he could confirm Mr. Williams's statement that the badger was not uncommon in parts of Kerry. In some of the lonely recesses of the natural woods the marten was very frequent, and did much damage in destroying the young of the game-birds of the country. Mr. Andrews had every reason to believe that the true wild cat was at one time well known in the Fiadhghleanna, or wild glens of the western parts of Kerry, for the description he got of it was totally different from that of the marten. The marten was called in Kerry "cat crann" (cat of the wood), and the wild cat known as the "cat fiadhachd" (hunting cat). The black rat some years since was very plentiful at a farm near Ballynunnery, county Carlow.

Occurrence of the Membranaceous Duck in Ireland.

Mr. Andrews made the following observations on this recent addition to the Ornithology of Great Britain:—

"This handsome species of duck was shot in the month of February, on the east side of Inch Island, Dingle Bay, in Castlemaine harbour, by a person who was in the habit of looking for water-fowl. There had been previously severe gales from the south-west, and he had noticed some birds which he considered were teal or the small brown wigeon. A flock of six birds were feeding in a muddy creek, at low water, and firing among them, the present specimen was the only one shot. He preserved the bird for Mr. Ross Townsend, the chief officer of coast guard, stationed at Cromane, Castlemaine harbour, who is well experienced, and has long been familiar with the varieties of water-fowl visiting that coast. Mr. Townsend at once saw that it was a species perfectly new to him, and he very kindly forwarded it to me in June last. After a most careful examination, I could not identify it with any of the described birds of Europe or of America; but fortunately having had the opportunity of visiting the British Museum in August, I readily recognised it as the membranaceous duck (*Malacorhynchus membranaceus*) of South Australia. Two specimens are labelled as having been sent home and presented by his Excellency Captain G. Grey, from South Australia, and are by no means a common species. On further inquiries, Mr. Townsend informs me that numerous small flocks of teal were occasionally seen feeding in the same locality, and that the person who shot the bird imagined the flock to be teal, and was therefore not led to examine them more carefully; but the impression made was, that they were all the same. After being fired at they flew to the eastward, in Castlemaine harbour. It is not probable that a solitary stranger, among a flock either of teal or of wigeon, would be the victim. The generic name, *Malacorhynchus*, appears to have been established by Swainson, the bill being similar to that of the *Chauliodus*, or common gadwall, but having the substance soft, the tips of the upper mandible on each side being furnished with a loose angular skin or membrane—the finely pectinated laminae of the upper mandible are like those of the shoveller (*Anas clypeata*), prolonged beyond the margins. These singular membranaceous appendages to the mandibles give it the specific name. There appears to me some confusion in the adoption of generic names, as the *Chauliodus* of Swainson, for the gadwall, adopted by Selby and other authors, already formed the genus *Chauliodus* of Schneider, followed by Cuvier, in the Ichthyology of his 'Animal Kingdom.' The *Chauliodus* belongs to the Esocidæ—pike family; *Chauliodus* being the only species known of that fish, and never taken except at Gibraltar. This small duck, the *Malacorhynchus membranaceus*, now recorded as visiting this country, has hitherto not been known out of Australia. It is termed 'Wrongi,' in New South Wales, and is

by no means of common occurrence. The colonists of Swan River call it the pink-eyed duck, from an oblong mark of rose pink being immediately beneath the dark patch surrounding each eye; the irides are a dark reddish brown, and the tarsi a yellowish brown. It is remarkable in having the neck, breast, and all the under parts crossed by numerous dark brown fasciæ. The sexes are similar in plumage, the male being only distinguished by being of larger size. This beautiful barring of the neck and breast is peculiar to some of the *Natatores*, and strikingly seen in the Magellanic goose (*Chloephaga Magellanica*), the Antarctic goose (*Bernicla Antarctica*), and also the ashy-headed goose of the Falkland Islands (*Chloephaga inornata*). In the southern latitudes of Australia the membranaceous duck frequents the fresh-water lagoons in company with the green-necked duck and the New Holland shoveller (*Spathulea rhynchotis*), the shovel-nose duck of the colonists. The latter is closely assimilated to the *Spathulea* of Europe. Another beautiful little species, *Malacorhynchus Fosterorum*, frequents the mountain streams of the interior. It is the 'Wiho' of New Zealand, being a pretty black duck with a white bill, and singular for its shrill whistle. As I have before mentioned, the specimens of the membranaceous duck in the British Museum were sent home by Governor Captain Grey, whose extensive knowledge of Australia will afford ample means of obtaining most valuable records of the productions of that country. Captain Grey, late of the 83d Regiment (now Sir Charles Grey), was appointed by Lord John Russell, when Secretary of State for the Colonies, to succeed Lieut.-Colonel Gawler, from the great talents he possessed and his arduous pursuit of knowledge."

Various Birds observed in Ireland.

Mr. Montgomery exhibited specimens of the great cinereous shrike (*Lanius excubitor*) and the black-capped warbler (*Motacilla atricapilla*), both shot by him in Beaulieu Wood, county of Louth. The latter, though not uncommon, was the first time he had met with it in that county. The shrike or butcher bird, was the fifteenth record in Ireland; and he would mention a singular circumstance relative to this bird. On the continent, in Germany and Holland, from the antipathy of this bird to the hawk tribe, the falconers use it for the purpose of capturing those birds of prey. In Holland the method was, when the falcons or hawks passed over the great heaths, the falconers placed a shrike, secured between three pieces of turf. On the appearance of a hawk, even at a great distance, the shrike commenced a violent screaming, which attracted the hawk to the spot. The falconer, in the meantime, had a live pigeon as a decoy; the hawk, in pouncing, was secured, the pigeon being drawn within a net set for the purpose.

Mr. Andrews said that with reference to the communication from Mrs. Blackburn, she further mentions that a turnstone with four young ones, unable to fly, were taken last June on the shore of Valencia, near the old revenue station. An attempt was made to rear the young, but it failed.

Election of Members.

The ballot having been announced, Walter Lindsay, Esq., of Rathmines, and William Compton Domville, of Santry House, were duly elected members.

The Society then adjourned to January.

January 17, 1854.—ROBERT CALLWELL, Esq., M. R. I. A., in the chair.

Donations.

Presented by James R. Dombrain, Esq., two handsome specimens, male and female, of the red or common squirrel (*Sciurus vulgaris*), which were shot at Avonmore, county of Wicklow; and by the same gentleman, a specimen of the godwit. Mr. Dombrain obtained this bird from a fisherman at the Pigeon-house, who found it nearly drowned, having taken one of the hooks.

Mr. Ffennel observed that the squirrel was not uncommon in many parts of Ireland; at Lough Inagh, in Connemara, it was very numerous.

Mr. Kinahan presented two specimens of the wood-mouse, or long-tailed field-mouse (*Mus sylvaticus*), male and female; and Mr. R. P. Williams presented a specimen of the black scoter duck (*Oidemia nigra*), shot near Sallins.

Adventitious Roots of Jussiaea grandiflora.

Professor Allman made some observations on a peculiarity of the adventitious roots of *Jussiaea grandiflora*, growing in the College Botanic Garden, (Phytol. v. 30).

Harbour Fish and the formation of Piscinæ.

Mr. Andrews made some "Remarks on Harbour Fish and on the formation of Piscinæ." He said—"I had some time since proposed to give a paper with reference to the harbour fish of the south-west coast of this country, viz., of such as were permanent residents in our harbours and estuaries, and of such as visited the harbours during the seasons of spawning. I found, however, from my notes, that it would be a subject of such magnitude that the interest and importance would ill be conveyed within the limits of a paper which the rules of our evening meetings prescribe. In this statement I shall as briefly as possible remark on some of the peculiarities and habits of those fish that are easily obtainable in our harbours throughout the seasons, for the object, not at the present of treating on their economical uses, but of creating an interest in a physiological point of view, by observing in those large glass cisterns or tanks, which may be termed 'piscinæ,' the habits, the modes of progression, and the seeking of food which influence marine animals. Most are aware of the great pleasure generally afforded to the visitors during the last year at the Zoological Gardens, London, in the examination of the numerous marine and fresh-water fishes, and of the Chelonia, or tortoises, which were seen in the full beauty and spirit of life in the large crystal cisterns and troughs. In the following I shall allude principally to the smaller kinds, chiefly marine, that would form objects of interest in their investigation, and in many instances may lead to views entirely new, as the absence hitherto of such facilities have led to decisions, and put forward in ichthyological works, too, at variance with physiological facts." Mr. Andrews then went through the classifications of the several genera of our marine fish, and said that among the Percidæ, or family of perches, the greater and lesser weevers (*Trachinus draco*, and *T. vipera*), were singular in their habits. The latter is most frequently met in sandy inlets, and I have in several cases witnessed the severe effects of its wound. It is well known in Kerry as the sting-fish, and it is surprising that some works on ichthyology still represent the injury to be caused by the dorsal spine; but my friend Dr. Allman has clearly proved the action to be from the strong opercular spine. It is a pretty fish,

streaked with brown and yellow, and with a silvery abdomen; having its eyes fixed upwards, like the gobies, it settles in the sand watching the approach of its prey. A few specimens of *T. draco* have been met with in Ventry harbour. Of the same family the striped red mullet (*Mullus surmuletus*) is of most remarkable beauty in its living state, its scales being of a brilliant red passing into a silvery pink on the belly. In confinement it timidly moves about, waving its barbels to and fro, as organs of touch. It is frequently taken in the herring-nets at the entrance of Ventry harbour, and is probably by no means uncommon there, and when taken from the nets exhibits great brilliancy of colouring. Its scales are easily rubbed from the body, so that those seen in the fish-shops in London, are rarely good specimens, the scales being all detached by the working of the trawl net they are taken in. The basse, or sea perch (*Labrax lupus*), is plentiful at seasons in Brandon Creek, and like several of our marine fish, thrives well, kept permanently in fresh water. Under the head of the mailed cheeks, or gurnard family, are the several species of bull-heads, such as *Cottus scorpius*, and *C. bubalis*, which are most amusing when captured. Some give a slight hissing sound, and make their formidable spines very prominent by the inflation of the head. Nothing can equal the extreme beauty of the *Cottus Grœnlandicus*, or Greenland bull-heads, fine specimens of which were taken in Dingle harbour—the richest tints of carmine, and deep maroon, with spots and barrings of most vivid brilliancy, characterize these beautiful fish in the state of life. The ova, or roe, is different from that of the other species, being of a fine scarlet, and which was remarkable in the species I dissected. The natives of Greenland are fond of this fish, and even eat the roe in a raw state. The pogge, or armed bull-head, is very frequent in the harbours and small inlets of the west coast. The action of this little fish, and the singularly recurved spines of the snout, must render an observation of its habits of interest. Of the sticklebacks, the ten-spined and the fifteen-spined frequent the harbours, particularly the latter—*Gasterosteus spinachia*—in great numbers in Dingle harbour. They are taken in the sean, and I have admired their playfulness and extreme beauty when placed in a tub of water. Except in anger or alarm they do not exhibit their spines, which lie closely adpressed to the dorsal ridge, in a sulcated groove. They are interesting in their movements in seeking and attacking their prey amid the tangled masses of *Fucus serratus* and *Confervæ*, and among which they form their nests and deposit their eggs; they unshyly, almost immediately after capture, seize the food offered. Passing over many species and families, which are altogether deep-water fish, the next presents the riband-shaped form—the *Tœnioidæ*—in which is the beautiful *Cepola rubescens*, red-band fish, which assumes the richest carmine to a pale rose-tint. It has frequently been taken on the west coast, and sometimes cast ashore among sea-weeds after a gale of wind. It is met with at low spring tides among the stems of *Laminaria* and the stronger *Fuci*. It would form a beautiful object in one of the crystal cisterns, and to observe its sinuously-gliding motions between the stems of sea plants, its eyes large in proportion to its head, directed in pursuit of the soft molluscous animals upon which it preys. Through the kindness of Dr. Farren I obtained a specimen from the south coast. Of the *Mugilidæ*, the mullets are among the most lively and playful of our harbour fish. The gray mullet (*Mugil capito*), is in great numbers in Ventry harbour, and of large size. Every water seems suited to their growth—salt, brackish, and fresh, and they are easily fed. The atherine or sand-smelt (*Atherina presbyter*), is in abundance in Dingle harbour, and frequents sandy inlets in the winter and spring months in great numbers, at which seasons they are in prime state for the table. They are in Dingle harbour all through

the year, but in spring approach the shore to spawn. It is different from the true smelt (*Osmerus eperlanus*), which belongs to the Salmonidæ, or trout family. The next contains a great many pretty species among the Gobiidæ, or the gobies. Of these the blennies are remarkable—the viviparous blenny possesses much of interest in its examination. The spotted gunnell (*Gunnellus guttatus*), is very numerous in Dingle harbour, and called the butter-fish, from the unctuous feel of the body. It is every tint of rich brown, yellow, and purple, and the large dark spots in some specimens are very conspicuous along the line of the dorsal fin. Young specimens of the sea-wolf (*Anarrhicus Lupus*), have been taken in Dingle harbour, and a large specimen in the bay, remarkable for its hideous head and powerful jaws. The black goby (*Gobius niger*), beautiful in the spawning seasons with the deeper shades it assumes, and the rich orange tints of its dorsal fins, is plentiful in Dingle harbour; and also the spotted, the one-spotted, and the double-spotted gobies have all been taken in Dingle and Ventry harbours, and also in deep water in the bay. In Ventry harbour I met with a very beautiful species, presumed to be the *Gobius reticulatus*, peculiar to the Mediterranean, and distinguished by the rich rosy tints of its dorsal fins. In a calm and sunny day in the month of August, and in a little sheltered inlet in Sneem harbour, I watched for some time the movements of multitudes of gobies. I was surprised at the numbers of the black goby, which occupied, with their young, a muddy recess between rocks, from which they occasionally darted, seizing and returning with their prey. The shanny (*Pholis levis*), was more exposed, and in sandy grounds; they occasionally rose to the surface perpendicularly with the aid of the pectoral fins, and with the aid of the same movement appeared singularly to raise themselves, or creep up the face of any perpendicular rock or stone. Both these species had numerous young, which they seemed carefully to protect. The speckled gobies were in clear, sandy, and sunny spots, and the two-spotted goby remained near the surface perfectly motionless. Of the dragonets, the gemmeous (*Callionymus Lyra*), is beautiful in the living state, richly marked, and the transparent beauty of its dorsal fins is singularly delicate. It is only obtainable in the trawl in deep water, for I have only met, in the harbour the sordid dragonet (*C. dracunculus*), which possesses no beauty. The family of wrasses, or Labridæ, vie with all others in the brilliancy and gaudiness of their colours. Of these I have obtained *Labrus maculatus*, *L. lineatus*, and *L. variegatus*, and beautiful specimens of the three-spotted wrasse (*L. trimaculatus*), in Valencia harbour—its colour most brilliant rose and reddish orange. In the sean, in Dingle harbour, I have taken the Comber wrasse (*L. Comber*), and a beautiful little wrasse marked with a lateral band similar to the rainbow wrasse, but having the abdomen reddish, and the head marked with wavy orange lines. The goldsinny, or goldfinny (*Crenilabrus cornubiensis*), I have taken in numbers; it is an extremely beautiful fish. I am certain that others of the Crenalabri will be met with on the coast of Kerry, and even some that are peculiar to the Mediterranean. There is no class of fishes that would be more beautiful in a vivarium, nor none that could be more easily fed, living as they do upon Crustacea and the harder Mollusca, which their jaws, armed with strong conical teeth, enable them to crush. Thus, imagine such a species as the *Labrus lupinus*—silvery, with three broad longitudinal bands formed of vermilion dots, with yellow pectorals and blue ventrals. The Esocidæ include the garfish (*Esox vulgare*), and which, in the young state, has afforded to me some degree of interest in the examination, particularly with reference to the supposed existence in our seas of a species of Hemiramphus. However, the numerous opportunities I had

of examining the different stages of growth confirmed me in the opinion that the Hemiramphus Europæus was no other than the young of the garfish, and that the young state of Esox belone presented an undeveloped form of the upper jaw, but which gradually extended in growth until maturity perfected its equal development with the lower jaw. In July immense numbers enter the harbours of Dingle and Ventry, seeking the fry of other fish, and to spawn, and they are taken in numbers in the sean, little cared for as food, but eagerly bought up by the fishermen for bait. In October and November the young appear. A specimen of the Saury pike (*Scomberesox Saurus*), is in the collection of the Society, which was taken at Ballina, on the coast of Sligo. There are multitudes of others I shall pass over, and some, although taken in the harbours, continue much longer in the fresh water, as the Salmonide, and which merely frequent at periods the salt-water estuaries. The several species of Motella, the third, fourth, and fifth bearded rocklings, are frequent in Dingle and Ventry harbours, and I have taken in a boat-trawl in Ventry the mackerel midge, the beautiful little Motella glauca. Of the Pleuronectidæ many in the young state are to be met with in the harbours. In the summer months the French or lemon sole (*Solea pegusa*), and the variegated sole (*Monochirus variegatus*), are not uncommon in Ventry harbour. The Cyclopteridæ, or suckers, are many of them very frequent; the Cyclopterus lumpus has been taken of large size in Castlemaine harbour, sometimes frequenting the salmon weirs. In some specimens the belly is of a rich azure. The Cornish sucker (*Lepidogaster cornubiensis*), has been taken at low water, attached to the stones in Smerwick harbour, its light tinge of carmine hue attracting attention. All the known British species of the pipe fishes (*Syngnathidæ*), I have obtained on the south-west coast; some are beautifully and vividly marked in the living state, and their singular marsupial habits would render observance of their movements and peculiarities interesting. The deep-nosed pipe fish (*Syngnathus typhle*), I met rather abundantly in the spring months in Dingle harbour, and the æquoreal pipe fish (*Acestra æquorea*), more frequent during summer. The former may be seen of an emerald green, beautifully barred, and the latter with rich tints of yellowish orange, barred with white lines. The Hippocampus brevirostris, or short-nosed sea-horse, has been taken at low water in Smerwick, adhering in its peculiar manner to the rigid stems of Cistoseira. Fish, like the gay plumage of our birds, assume their gaudiest tints in the bridal season, and this is remarkably seen in the Syngnathidæ, in the Cottidæ, and in the gobies. Skates and rays and the singular horny pouches containing the young, are met in all the harbours; but sufficient has been said of the interest that exists to the naturalist, and which a dredge and a small boat-sean can always command the capture of. To follow out more closely such investigations, how interesting would be the experiments resulting from daily examination of the habits of these different fish placed in those large tanks, with shingly and sandy beds, rock, and with sea plants and Confervæ, to please their habits and tastes. Thus, beautiful fields of interest are laid open to the astonishment of the admirers of Nature's works, and the hidden mysteries of the tenants of the deep, unveiled and unravelled to physiological science. In the large cisterns of the vivaria, at the Zoological Gardens, I have watched with interest the perfect lifelessness of the pike and the perch—they appeared like beautifully varnished specimens suspended in the fluid—motionless and inanimate, and no perceptible pulsation of the operculi or gill-covers. Living in an element heavier than air, and suspended in a liquid of nearly the same specific gravity as their own bodies, their forms are beautifully proportioned to offer the least resistable

force to progression, while the muscular powers of the tail in some and of the pectoral fins in others are admirably adapted to rapid movements of progression and of elevation. Fishes, of all vertebrated animals, are said to be the least sensitive of emotions of pain or pleasure—their organs of sensation awaken no impressions—rigid in countenance, and eyes almost immovable, and which no tears dim, nor eyelids protect, they seem, with all their beauty of form and brilliancy of colour, mere automata in sensibility, and mute as the silent depths they inhabit. This in the fullest extent is not strictly accurate, for they recognize the hand that feeds them, and follow apparently with joy and sportive liveliness the movements of those who protect them." Mr. Andrews then alluded to the great interest of the vivarium which some years since had been formed and kept up by Mr. Bland, of Derriquin Castle, Kenmare Bay. In an inlet, guarded by reefs of rocks in Sneem harbour, a strong barrier of stones had been closely formed across the entrance, but through which every tide flowed and ebbed, leaving a sufficiency of water within. In this, mullet, whiting, bream, soles, and plaice succeeded best—haddock also did well, but gurnards became paler in colour. Whiting became so tame as to feed out of the hand, and all assembled at the feeding time at the appearance of the tray—all seemed fond of potatoes. This singular character is strikingly shown in the Natatores, particularly in the mergansers and sheldrakes, birds whose formation of bill appears only adapted to feed on the shell-fish and soft Mollusca, their habitual diet. When tamed or domesticated they greedily eat potatoes, altogether rejecting the food of their wild habits. Many admirable positions existed on the west coast for the formation of extensive marine store ponds; and where turbot, soles, haddock, cod, and lobsters, could be securely stored and made available in times of scarcity and boisterous weather. Under such circumstances the artificial propagation of the turbot, the sole, and the cod-fish and haddock, could, with the same results, be accomplished from the spawn, as the propagation of the ova from the salmon or trout.

The Chairman considered the subject brought forward was one of great value, not alone to the scientific man, but in a practical and economical point of view. He would confirm, with regard to the fisheries, how useful the formation of those store ponds would be. At the island of Inishtrahull, about six miles from Malin Head, off the coast of Derry, he had observed the islanders were prepared to bring fish to vessels passing the island. The fishermen of that island had very fine whale-boats, which were sheltered and drawn up in a sandy creek. In a store-pond, naturally formed in the island, the fish taken by them, such as turbot and other prime fish, were deposited, and they were always prepared to put fish on board the steamer passing from Sligo to Glasgow, or to Liverpool.

Mr. Ffennell, Commissioner of Fisheries, observed that the concluding part of Mr. Andrews' statement was one of great importance, and as it bore upon the artificial propagation of fish, he would take the opportunity of saying a few words as to what was doing in the salmon fisheries of this country. He would first read a report that had been made to the Commissioners of Irish Fisheries, by Mr. Buist, of Perth. Operations were extensively carried on in December last in a small ford of the Tay, under the direction of Mr. Ramsbottom, of Clitheroe, who has conducted very extensive experiments in pisciculture, both in England and Ireland. The boxes for hatching are about 300 in number, which will contain upwards of 400,000 ova. In the management of the experiments none of the ova are lost, and the old salmon are not in the least hurt by the operation. Mr. Ramsbottom conducted the experiments for

Messrs. Ashworth, of Lough Corrib. The boxes are placed to the free action of running water, and the ova settle, distributed through the gravel that forms the bed of the boxes. In the month of March the fry will have burst their shell. Mr. Buist deserved great credit for publishing regularly the reports of his progress. Mr. Ffennell had received a large quantity of the impregnated ova, and he had sent about 30,000 to Mr. Canes, at St. Woolstan's, for the purpose of carrying on the propagation in the Liffey. Mr. Ffennell also read a report from Mr. Doherty, of Bushmills, who states that he had deposited in boxes about 12,000 ova. He made those deposits on the 1st, 15th, and 26th December last. The boxes are 36 feet long, 18 inches wide and 9 inches deep. The ponds are 88 square yards, by 4 feet deep, and are supplied with a regular stream of water from the river Bush. So far, Mr. Doherty's experiments are going on successfully. Mr. Ffennell said he had a large quantity of the ova, which he was experimenting on at the Custom-house, and he would, from time to time, present to the Society phials of the ova, showing the progressive development, and he would further be most happy to assist any who were desirous of following similar experiments and investigations. Mr. Ffennell was also happy to say that the young fry which created so much interest at the Exhibition were thriving and growing well. A few days since he took one with a small net from the tank, of which he had an accurate drawing and measurements made. Its length was $4\frac{1}{2}$ inches, showing the size of growth from the time he first got them in June. At that time they were barely an inch in length. Any of the members calling at the Custom-house, it would give him much pleasure to show them.

Mr. Geo. A. Pollock said that in the time of the Earl of Hardwicke the Irish fisheries were considered of the highest importance, and that it was remarked in a correspondence, that it was one of the principles inculcated on the members at their election, that they should support the Irish fisheries.

James Haughton, Esq., of Moorfields, Roebuck, was elected a member.

GREAT PRACTICAL NATURALISTS' EXHIBITION.

At a preliminary Meeting held during the last month, it was unanimously agreed, that the best mode of promoting the science of Natural History was to open an Exhibition, at the Victoria Gardens, Bury, Lancashire, in April, 1854, of every description of preserved quadrupeds, birds, reptiles, insects, shells, and every other branch of Zoology. It was the general opinion of that Meeting, that the only mode they had at present to improve themselves, was by going to see each other's specimens, which often lay at a distance of many miles from each, and took so very much time, and was so expensive; and not having each other's specimens to compare, in many cases they were little improved. It was the opinion, that by having all together, by seeing and comparing them a few times, they might learn as much in seven years as at present; and especially, as there will be living specimens of eagles, hawks, owls, gold, silver, and other pheasants, rare species of wild ducks, red-legged, and other partridges, bitterns, herons, storks, spoonbills, ruffs, godwits, &c., all living on the spot to compare with those stuffed. There will be a General Meeting of all persons interested in the above, held at the house of Mr. G. Hamilton, New-Market Inn, Bury, on Sunday, the 29th day of January, 1854, at two o'clock in the afternoon, precisely.—*G. Booth; Bolton-street, Bury.*

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

Anniversary Meeting, January 23, 1854.—EDWARD NEWMAN, Esq., President, in the chair.

The Secretary read the Bye Law pertaining to the Annual General Meeting, and the Report of the Library and Cabinet Committee, made to and adopted by the Council. Read also an abstract of the Treasurer's Accounts, from which it appeared that the finances of the Society had quite recovered from their depressed state at the end of 1852, and that the income and expenditure were now about equal.

The President having appointed two Scrutineers, the ballot took place; when it appeared that Messrs. W. S. Dallas, Edward Sheppard, F. Smith, and H. T. Stainton were elected into the Council, in the room of Messrs. J. Curtis, E. W. Janson, W. Spence, and J. O. Westwood; and that the following gentlemen were re-elected to the respective offices for the ensuing year:—Edward Newman, Esq., President; S. Stevens, Esq., Treasurer; and J. W. Douglas and W. Wing, Secretaries.

The President then delivered the following Address: for this, and his services to the Society during the year, the Meeting passed a vote of thanks, and he was requested to allow his Address to be printed.

Votes of thanks were also passed to the Treasurer, Secretaries, and retiring Members of the Council.

THE PRESIDENT'S ADDRESS.

GENTLEMEN,

In returning into your hands the important office with which you have intrusted me, I should neither be performing my duty, nor obeying the dictates of my own inclination, were I not to express to you my sincere gratitude for the kindness with which you have invariably received me. I came amongst you a comparative stranger to all, an entire stranger to the majority: not only, as I conceived, by no claim or merit of my own, but quite in opposition to my own often-expressed, and still unaltered judgment, that the office-bearers of every Society should be selected from among its most active and useful members. Notwithstanding these sentiments I came forward at your call, have been received by you with the utmost kindness and indulgence, and shall ever remember with pleasure the period during which I have enjoyed the honour of presiding over you.

The duties of President, and indeed the general business of the Society, are so new to me, that I cannot help fearing that some of my

observations thereon may appear unimportant, or out of place; but I still trust to your indulgence, and, as every fresh actor is found to give some new reading to a part, however variously it has been played before, so it is probable that each successive President may be struck by some point or other which his predecessors had either designedly or unintentionally overlooked. You will, I am sure, bear with me while I briefly allude to one or two subjects which have particularly attracted my attention.

The first of these is the peculiarly, although not exclusively, *British* character of our proceedings. Our science is truly cosmopolitan: but it is the honour and glory of a naturalist to make himself thoroughly acquainted with the productions of his own country. How immutably true, and how profoundly patriotic, is the Linnean axiom, "Turpe est in patriâ vivere et patriam ignorare." Let us begin at home: let us make ourselves thoroughly acquainted with the Natural History of Great Britain: and, that end achieved, we may enlarge the circle of inquiry by degrees. Let us not grasp too much at the outset. The same observation applies generally as well as geographically; by restricting our research to a class, an order, or a family, we are enabled to give it more intense attention. What an intimate knowledge have Zeller, Stainton, our worthy Secretary, and others thus acquired of the Micro-Lepidoptera; Mr. Dawson of the British Geodephaga; Mr. Doubleday and Mr. Edwin Shepherd of British Lepidoptera; Mr. Walton of British Curculionidæ; Schönherr of Curculionidæ generally; Chevrolat of Cerambycidæ; Pictet of Phryganidæ; Gravenhorst of Ichneumonidæ; Mr. Smith of Aculeate Hymenoptera, and especially of our British bees; Meigen and Walker of Diptera! I might cite fifty examples equally striking, and all equally establishing the fact that the more restricted the range of inquiry, the more certain, precise, and durable will be its results. The debilitating effect of desultory study is obvious to every psychologist. It is with mind as with matter, the more extensive the surface it covers the more attenuated will be the covering. Study, in order to be productive of useful results, must be concentrated and systematised: it then shines brightly forth on the path of the future student.

The communications which have struck me as possessing the most absorbing interest are such as relate to insects which exert an important influence over man, whether for his benefit or injury: such, for instance, as that by Mr. Hanbury, on the wax insects of China; that by Mr. Oswell, on the cattle fly of Africa; and that by Captain Cox, on Scolytus: in these instances man is brought into

absolute contact with the insect : in the first this contact is entirely beneficial ; in the others entirely the reverse : and mankind would be infinitely indebted to the entomologist who should, by attentive observation, detect the means of increasing the benefit or of mitigating the injury. To the discussions which have resulted from these and other communications, I have always listened with the deepest interest and most profound attention ; and I have been peculiarly gratified to observe the uniformly courteous manner in which they have been conducted. There is scarcely one scientific subject which we can all view in the same light, and the difference of opinion, which of necessity results from the different mental constitution of individuals, is in itself an important element in our search after that truth which is the kernel of the whole question, the reward we obtain for our labour in clearing away the tasteless and seemingly impenetrable husk with which we so often find it invested. Nevertheless, this difference should ever be urged, as it has been, with that courtesy and that respect for the feelings and the judgment of others, which dignifies alike the original opinion and the objection, and which evinces a love of truth overcoming a love of conquest. I could wish that a month's notice were given of any paper likely to excite such discussions : the most prosperous of all our Societies, the Royal Geographical, adopts this course ; and I have actually read this day in the 'Morning Herald' an advertisement of the papers next to be discussed : by this expedient we should escape both objections and adhesions carelessly and hastily given, and out of our abundant printed "treasures, things new and old might be brought forth," and thus much additional information diffused among our members : it has several times struck me as somewhat inconsistent for any scientific body to discuss, as new, matters which have long since been carefully investigated by our predecessors. But these remarks do not, in any degree, apply to the mere introduction of papers : gladly would I see the greatest possible encouragement given to such introduction ; and no one could object to being referred, with courtesy, to sources whence he might derive more perfect information.

On one subject I venture to express an opinion at variance with what appears a prescriptive practice. I repeatedly find in entomological works the indication of a desire to depreciate that particular branch of the science which some one else has taken, or is supposed to be taking up. Such terms as "species-man," "mere collector," "theorist," and many others, need but be quoted in explanation of my meaning. Now the sentiment implied by such expressions is unphilo-

sophical; it is not in accordance with the catholicity of science; it implies that we are drawing a comparison between ourselves and others disadvantageous to those others, and it therefore has a direct tendency to foster, if not to create, feelings that ought not to exist. The Lepidopterist, the Dipterist, the Hymenopterist, or Coleopterist; the systematist or the utilitarian; the student of economy, or the collector; the man, in fact, who selects, of his free choice, his own particular, favourite objects of study, and yet who presumes to look down on another who has made a different choice, exhibits a want of that philosophical spirit which would assure him that all these work together harmoniously for the general good: all are equally striving after the *excelsior* of the poet: each is ascending, after his own fashion, the hill of science: and not only must he have perfect liberty to select his own path, but, if he be only industrious, he will establish an indubitable claim to the merit of strewing that path with flowers which any of us may gather. One man studies an insect solely with a view to increase its pecuniary benefit, or diminish its pecuniary injury to man; another observes the bee building her cells and storing her honey simply as a matter of amusement; a third watches the *Ichneumon* as she glides with shivering antennæ over the surface of a leaf until she find the larva on whose living flesh her young is destined to feed; a fourth, with greater perseverance and more determined zeal, elaborates the previously unknown history of a single individual from the ovum to the imago; a fifth, by the aid of microscope and scalpel, thoroughly masters the phenomena of intimate structure, tracing every system of organs in its wondrous permeation of the insect frame, and not resting here, carries the physical knowledge thus gained into the wider and still more interesting field of physiology; a sixth spends days and nights in the capture of insects simply induced by their rarity; a seventh consumes the midnight oil in describing the new or the beautiful or the curious; an eighth ponders over systematic classification; a ninth labours to complete a monographic history: all these are hastening to the same terminus; are all, in fact, on their way upwards. We have long since been told that members of the human body must work together in concert: that the head must not say to the hand "I have no need of thee," or the hand to the feet "I have no need of you:" so with our science; the monographer cannot say to the collector, I have no need of you: the very admission of such a thought is a stumbling-block in our own way, a bar to our own progress. I wish to be understood as applying this last observation especially and emphatically to the case of the

actual collector ; to the man who, in whatever station of life, devotes his time, by night and by day ; at all seasons, in all weathers ; at home and abroad, to the positive capture and preservation of those specimens which serve as the objects for all our observations : he is the real labourer in the field, and if we would keep the lamp of our science constantly burning, it is to him alone that we can look for fuel to feed its flame.

With regard to collectors at home, I will only say, without mentioning names, that many members of our own Society have displayed more zeal and greater industry than would have sufficed for the accumulation of almost boundless wealth, and yet the only object they have sought has been the acquisition of treasure for the mind ; the only reward they have desired, the satisfaction of possessing that which is rare or beautiful. I must also allude, if but for a moment, to the advantages derived from the labours of still another class, those who, led by an instinctive taste to the pursuit of Entomology, have rendered that taste subservient to pecuniary gain ; I allude to such men as Bonchard, Weaver, Standish, Harding, and Foxcroft : how often have these made truly valuable contributions to our stock of knowledge ! And is it not this result alone that, in fairness, we can consider ? Such men do great, permanent and continual good : they render our science an unquestionable service, and their motives are no more to be called in question than those of the artist or the author, who receives the just reward of his well-directed labours.

The results of collecting in Britain, during each successive year, appear almost incredible ; and, when we recollect the indefatigable zeal of those who have preceded us, it seems surprising that so much should be done. Our English collectors seem to have found in Scotland comparatively a virgin soil as regards Entomology, and a soil, I may add, of incomparable richness.

From British collectors the transition is easy to others, who, inspired by a like taste, led on by an insatiable thirst for a more intimate acquaintance with Nature in her grandest phases and forms, have left their homes, have abandoned their prospects of worldly welfare, and have sought, in warmer climes, those glorious creatures which our chilly regions cannot produce. Your late Secretary, once my most beloved and intimate friend, was one of these ; and it has always been my belief, that while assiduously collecting in the Floridas, he laid the foundation of that painful and lingering disease which finally deprived our science of one of its brightest ornaments. Another loss, truly to be lamented, but of a very different character, is that we have

sustained, not in the death of an individual, but in the destruction of a zoological treasure ; I allude, of course, to the collections made by our friend Mr. Wallace. That energetic traveller, led by the thirst I have already described to behold with his own eyes, and not through the too often distorting medium of books, the exuberant luxuriance of animal and vegetable life as developed by the rays of a vertical sun, devoted himself to the acquisition of, and actually acquired, a most intimate knowledge of the Natural History of the Valley of the Amazons ; but alas, returning with his hard-earned treasures, the ill-fated 'Helen,' in which he was a passenger, took fire and went down in mid-ocean, leaving our friend to buffet with the waves. Providentially he escaped ; he was picked up by the 'Jordeson' two hundred miles from land, and has lived to record in glowing words the history of his discoveries, his triumphs, his losses and his preservation. I cannot forbear to quote from his own pen the record of his feelings, when, no longer in jeopardy, he first realized the enormous loss he had sustained :—

"It was now, when the danger appeared past, that I began to feel fully the greatness of my loss. With what pleasure had I looked upon every rare and curious insect I had added to my collection ! How many times, when almost overcome by the ague, had I crawled into the forest and been rewarded by some unknown and beautiful species ! How many places, which no European foot but my own had trodden, would have been recalled to my memory by the rare birds and insects they had furnished to my collection ! How many weary days and weeks had I passed, upheld only by the fond hope of bringing home many new and beautiful forms from those wild regions ; every one of which would be endeared to me by the recollections they would call up ; which should prove that I had not wasted the advantages I had enjoyed, and would give me occupation and amusement for many years to come ! And now every thing was gone, and I had not one specimen to illustrate the unknown lands I had trod, or to call back the recollection of the wild scenes I had beheld ! But such regrets were vain, and I tried to think as little as possible about what might have been, and to occupy myself with the state of things which actually existed."

Mr. Wallace is now on the eve of departure for the eastern instead of the western world ; he sails in H. M. S. 'Frolic,' first to Sydney and then to the islands of the Eastern Archipelago. His face is familiar to us here ; his writings are known to most of us, and some of them are on the point of publication in our 'Transactions.' I am

sure that there is not one member of the Society but will wish him God speed !

Commensurate to the losses of Mr. Wallace have been the successes of Mr. Bates. Next to those of our own country, we have been accustomed to regard the insects of South America as those with which we were most intimately acquainted: the *Morphos*, notwithstanding their magnificence, the *Buprestes*, the *Cerambyces*, the *Scarabæi*, notwithstanding their magnitude, were yet regarded with comparative indifference; they were familiar as household words, and because familiar, they were held in little estimation. But Mr. Bates has developed new features in the Entomology of that extraordinary continent; has sent us collections which astonish us equally by the countless profusion, the variety, the novelty, and the excessive loveliness of the species which they contain. And here I venture to make a passing allusion to finance; and I do this without any collusion with Mr. Bates or his agent, our respected Treasurer. I wish to remind you that collecting objects of Natural History in South America is most expensive; that the mere transit of the entomologist from place to place, accompanied only by so much apparatus, and so many assistants as are absolutely necessary in virgin forests, where railroads, coaches, or even stage wagons are unknown, is in itself a formidable item of expenditure; and requires almost incessant labour to procure sufficient specimens for their sale to supply a bare return of the cost. Gladly would I induce even those entomologists who are not forming collections of foreign insects to bear a part of the burden, and to contribute their mite towards promoting a cause which must tend so materially to the advance of our science. But Mr. Bates, like Mr. Wallace, has contributed observation as well as manual industry: he has given us valuable information on economy, and, in his zeal for the acquisition of specimens, has not failed to make the needful commentary on their habits and manners, their food and their metamorphoses.

I must also mention, and on behalf of this Society, with profound gratitude, the generosity of our corresponding member, Mr. Thomas Jones Stevens, of Bogotá: the exhibitions of this gentleman's beautiful insects have added interest to our meetings, and the presentation of them has greatly enriched our collection.

Neither must I forget Mr. Edgar Leopold Layard, now present at our meeting, who has lately made a very large collection of Cingalese Lepidoptera, including an unusual number of the smaller species, particularly *Pyalina*.

The records and the collections to which I have been alluding, principally British, but occasionally exotic, have combined with others of economical or descriptive character to enhance the interest and attraction of our meetings; and I rejoice to observe that these are invariably well attended. I know of no Society in which the average attendance is so large in proportion to the actual number of members; and this leads me to remark on our acquisitions and losses under this head.

Five years ago it was thought desirable to institute a second class of members, to whom the name of Subscribers was applied. During the past year we have elected ten members and nine subscribers, and I regret to say have lost no fewer than four members and ten subscribers, thus giving us a gain on the year of six members, and a loss of one subscriber. With a single exception, our losses have occurred from resignation or default of payment; the exception is Mr. William Lancey, whose death we have to lament.

Mr. William Lancey was elected on the 5th of April, 1852, and towards the close of the same month, having accepted an appointment in the engineer's staff of the East Indian Railway Company, left this country for the seat of his employment. In April last, in the vicinity of Calcutta, he was seized with fever, from which he was apparently slowly recovering, when, at the recommendation of his friends, he undertook a palanquin journey to Delhi, for the purpose of recruiting his strength; on his return, however, to Calcutta, the excitement attendant on the trip subsiding, he grew rapidly worse, and alarming symptoms presenting themselves, he was urged at once to return to England; to this he acceded, but unhappily the virulence of the fever had so prostrated him that he never rallied, and expired on the 5th of May, a few days subsequent to the departure of the vessel. During his short sojourn in India he prosecuted Entomology with enthusiasm, and his collections, now in his father's possession, afford ample evidence how industriously he devoted every spare moment and opportunity to its pursuit.

During the year we have lost two other entomologists, unconnected indeed with our Society, but whose names have long been familiar to the veriest tyro in our science; I allude, of course, to Friedrich Germar and the venerable Fischer de Waldheim.

Ernst Friedrich Germar was born on the 3rd of November, 1786; at twelve years of age he was sent to school at Meiningen, where one of our most illustrious entomologists, Clairville, was then residing: in 1807 he removed to Leipsig, and purchased the celebrated collection

of Inspector Hübner, in Halle: this collection is repeatedly referred to in the works of Fabricius, and was valuable as containing many of the type-specimens of that great entomologist. He here also made the acquaintance of Kunze and Kaden. In 1810 he obtained the degree of Doctor of Philosophy in the University of Halle. In 1811 he made a tour in Dalmatia. In 1815 he married Wilhelmine Keferstein, with whom he lived happily, although childlessly, during the remainder of his life. In 1817 he was appointed extraordinary, and in 1824, ordinary Professor of Mineralogy in the University of Halle: he died in July 1853, aged 66 years and 8 months.

The works of Professor Germar are numerous and valuable, principally on the sciences of Entomology and Mineralogy, in both of which his reputation stood very high. The first series of Professor Germar's Magazine was commenced in 1813, and concluded in 1818; and the second was commenced in 1839, and continued under the same title till 1845, when it merged in the '*Linnæa Entomologica*,' which is still in course of publication. Professor Germar's most important entomological works are as under:—

'*Dissertatio sistens Bombycum Species secundum oris partium diversitatem in nova genera distributas*,' 1810—1812.

'*Magazin der Entomologie*,' 1813—1822.

'*Reise nach Dalmatien*,' 1817.

'*Insectorum Species novæ aut minus cognitæ descriptionibus illustratæ*,' 1824; (contains descriptions of 891 species and 42 new genera of Coleoptera).

'*Fauna Insectorum Europæ*,' 1817—1847.

Professor Fischer de Waldheim, one of the few eminent entomologists that Russia has produced, was the last of that glorious band of naturalists whose fame was ushered in with the present century; the last, I should say, excepting that still more celebrated philosopher, the Baron von Humboldt: both these illustrious men have enjoyed, for at least half a century, a reputation which year after year has increased in lustre. Professor Fischer was born at Leipsig in 1770, and, after a most useful and energetic life, died at Moscow in 1853, at the advanced age of 82 years. In 1797 he accompanied Humboldt to Vienna, intending there to practise medicine, but devoted himself entirely to the study of Natural History, and more especially to that of the fishes of the Danube. He afterwards made a scientific journey through Germany and Switzerland, and then removed to Paris, where he aided Cuvier in his grand work, the '*Ossemens Fossiles*.' In 1804 he accepted the situation of Professor and Director of the Museum at

Moscow, and continued to occupy it to his death. He founded the Imperial Society of Naturalists of Moscow, contributed largely to the Russian 'Annals of Natural History,' and occupied himself most indefatigably with all branches of his beloved science. His writings are numerous, and amongst them is a curious and valuable typographical history of the Bible. He was a member of more than eighty learned Societies, and was knight of the principal Russian orders: the honours he received in his own country afford a notable instance that Russia is not indifferent to scientific merit.

By our Treasurer's Report you have heard that our finances are in a very satisfactory state: it appears that, whereas, at the last audit, a deficiency of £28 was reported, it is now announced that our liabilities are no larger than our balance in hand, so that an improvement of nearly £30 has taken place in our fiscal condition. It must, however, be borne in mind, that £22 of our income in 1858 arises from a subscription raised for the express purpose of defraying previous expenses; and, much as we are indebted to those members who so generously assisted on that occasion, it is neither prudent nor just to look forward to such a source of revenue, but rather so to restrict our outlay that it shall always fall within our legitimate income. During the year we have issued three parts of the 'Transactions,' and since the close of the financial year a fourth, which was laid on your table at the last meeting: these are got up in the usual style of correctness, and are illustrated in a manner that must gratify our members and subscribers: with the value and importance of their contents you are already perfectly familiar.

By the Report of the Library and Cabinet Committee you have learned that both these departments are progressing favourably; and if there is a single cause for regret connected with either, it is that our really fine entomological library is not made more extensively useful by our members. Of our exotic insects I may, perhaps, be allowed to remark, that I consider it more desirable to obtain an arranged series of types than to attempt the formation of a complete collection of species: the cost of the former is trifling compared with its utility; the cost of the latter would be overwhelming to such a Society as ours, but devolves with propriety on a national institution. In this observation, I must not be understood as referring to the money-value of the specimens themselves, of which I know nothing, but simply to the items of cabinets, rooms, and labour in arrangement and preservation.

My predecessors have given a summary of entomological publications: I am glad to be relieved from this labour by the knowledge that the Society cannot judiciously incur the expense of its publication; and secondly, that the task is annually performed by my friend, Dr. Schaum, in the most complete and admirable manner in the 'Bericht,' which is presented by the author for the information of our members. The following works published in Britain may, nevertheless, be enumerated:—

'*Insecta Britannica*,' Vol. ii. 'Diptera;' by Mr. Walker.

'*Exotic Butterflies*;' by W. C. Hewitson, Parts v.—viii.

The following Catalogues of Insects have also been printed during the year, by order of the Trustees of the British Museum.

'*Catalogue of Longicorn Coleoptera*,' Part i.; by Mr. White.

'*Catalogue of Hymenoptera (Andrenidæ)*;' by Mr. Smith.

'*Catalogue of Homoptera*,' Part iv.; by Mr. Walker.

'*Catalogue of Neuroptera*,' Part iv.; by Mr. Walker.

'*Nomenclature of British Hymenoptera*;' by Mr. Smith.

'*Nomenclature of British Neuroptera*;' by Mr. White.

'*Nomenclature of British Diptera*;' by Mr. White.

Four important works are announced as in a state of forwardness, and three of them are advertised as in the press. I have no doubt that all of them, when complete, will advance the study of Entomology, and will reflect honour on the various authors.

1. '*Insecta Maderensia*;' by Mr. T. V. Wollaston.

2. '*Geodephaga Britannica*;' by the Rev. J. F. Dawson.

3. '*Insecta Britannica*;' the third volume of the series comprising the '*Micro-Lepidoptera*;' by Mr. Stainton.

4. The '*Natural History of the Tineina*;' published under the superintendence of a Committee, consisting of Mr. Douglas, Mr. Stainton and Mr. Wing. A very novel feature in this work is, that it will be printed in four languages, English, French, German, and Latin. There can be no doubt that this will be a great advantage, seeing how often scientific works printed in one language, and that modern, become, as it were, sealed books to the majority of the scientific world.

On the continent the following works appear to demand an especial notice:—

'*Monographie des Guêpes solitaires ou de la Tribu des Euméniens*;' par H. F. de Saussure.

'*Lepidoptera Microptera quæ J. A. Wahlberg in Caffrorum terra collegit*;' by P. C. Zeller: published at Stockholm in 1852. This

work contains descriptions of upwards of a hundred species, and is remarkable as referring solely to the Micro-Lepidoptera of a country of which I may truly say we were previously quite uninformed.

Gerhard's so-called 'Monograph of the Lycænidae' is also completed, containing coloured figures and names of almost every species, and forming a moderately-sized 4to. volume: when I state that of this volume 21 pages only are letter-press, the explanatory term of "so-called," will, I trust, be understood.

M. Fischer has published a 4to. volume with plates, intituled 'Orthoptera de Fribourg.'

In the United States a new and improved edition has been published of Dr. Harris's elaborate work on 'Insects injurious to Vegetation.' This is a work of great merit; and, although its utility is mainly confined to the district of the insects of which it more especially treats, yet it is well worthy the deep and thoughtful study of every entomologist, and particularly of such as make economy and economic relation of insects with man the especial objects of their research.

The 'Linnæa Entomologica,' 'Entomologische Zeitung,' and 'Annales de la Société Entomologique de France,' have all appeared as usual.

And now, Gentlemen, it only remains for me to thank you for your very indulgent attention. I am well aware how imperfect my brief address must appear when compared with the learned and detailed summaries prepared by my predecessors: but I trust entirely to your kindness in avoiding comparisons, and in accepting my humble attempt to express opinions, to which the Society is in no way pledged, and which I earnestly desire may only pass as those of an individual member.

February 6, 1854.—E. NEWMAN, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Bulletin de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique,' Tome xx. Parts 1 and 2: 'Mémoires Couronnés,' Tome v. Part 2, Tome vi. Part 1: 'Instructions pour l'Observation des Phénomènes Périodiques': 'Mémoires de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique': all presented by the Academy. The 'Zoologist' for February; by the Editor. 'Monographie des Guêpes Sociales,' par H. de Saussure, Cahiers 1, 2, and 3; presented by the Author. The 'Athenæum' for January; by the Editor. The

'Literary Gazette' for January; by the Editor. The 'Journal of the Society of Arts' for January; by the Society. A box of British Lepidoptera, by P. H. Vaughan, Esq.

Nomination of Vice-Presidents.

The President nominated as Vice-Presidents for the year W. W. Saunders, Esq., F. Smith, Esq., and H. T. Stainton, Esq.

Prize Essay for 1854.

It was announced that the Council, on behalf of the Society, renewed for this year the offer of a prize of £5 5s. for the best Essay on the Natural History of the Coccoi injurious to British fruit-trees, especially of the "mussel-scale blight" of the apple, considering that the short notice given last year may not have given time for the preparation of such a paper. And the Council also now gave notice that they would award a similar prize for the best Essay on the Natural History of the Coccus which produces the lac-dye of commerce, which should be delivered to the Society on or before the 31st of December, 1855; and it was stated, as an encouragement, that Dr. Royle had kindly promised that the information at present possessed by the East India Company, or any other that the resources of that Company could procure from India on the subject, should be at the service of those who might be induced to take it up.

Election of Members.

The following gentlemen were balloted for and elected Members of the Society:—George Brownell, Esq., Shaw Street, Liverpool; John Maxwell Savage, Esq., 26, Gloucester Place, Portman Square; Francis P. Pascoe, Esq., F.L.S., Fern Lodge, Kensington; Jacob Birt, Esq., Sussex Gardens, Hyde Park: and J. R. S. Clifford, Esq., Pimlico, was elected a Subscriber.

Exhibitions.

Mr. E. L. Layard exhibited several large cases of Lepidoptera collected by him during a residence of several years in Ceylon; nearly all in fine condition, and including species of great beauty and rarity.

The President exhibited a perfect male and female, as well as the larva-case and a drawing of the larva of a Sackträger, found by Mr. Bates in the interior of Brazil; it was evidently a species of *Saccophora*, and he proposed to call the species *Batesii*: he was preparing a detailed account of this curious genus, to which he would again call the attention of the Society as soon as some illustrative drawings had been prepared.

Mr. Douglas exhibited a *Phigalia pilosaria*, taken at 11½ p.m., on the 21st of January, sitting on a gas-lamp, at Lee. This appearance, so very early in the season, was the more remarkable from the continued low temperature existing to within a few days previous. He remarked also, with reference to the hour of its capture, that he had always seen moths on the street-lamps to be more numerous after 10 o'clock at night. Since the late mild weather had set the grass growing, he had noticed young hibernated larvæ of *Elachistæ* mining in the newly formed leaves.

Mr. Stevens exhibited *Argynnis Paphia*, ♂, a variety in which the black spots on the upper surface of the wings, usually of a round form, were run together into oval patches; also *Argynnis Euphrosyne*, ♀, a variety with a black band across the centre

of all the wings, giving it the appearance of a distinct species. Both specimens were captured by Mr. Johnson, near Ipswich. Mr. Stevens also exhibited specimens of *Elater impressus*, Fab., a new British species, captured at Rannoch, in 1853, by Mr. Weaver and Mr. Foxcroft.

British Elateridæ.

Mr. Curtis read a paper entitled "Critical Remarks upon the British Elateridæ, with Descriptions of some of the Species."

New Work on the Genera of Coleoptera.

Mr. Waterhouse called the attention of the Meeting to a work about to be published in Paris, by subscription, entitled '*Genera des Coléoptères*,' par M. Jacquelin du Val, with plates by M. Jules Migneaux. The whole work will be comprised in 86 parts, large 8vo., each of which will contain 3 plates of 5 coloured types, details of generic characters, and corresponding text, and the price 1½ franc.

Species of Cherrus and Polyphrades.

Mr. Waterhouse stated that during last autumn he visited Oxford for the purpose of examining a portion of the Rev. Mr. Hope's collection, and that after that visit he communicated some observations which he had made relating to certain species of Curculionidæ (which were described by Schönherr, from specimens in the collection in question) to M. Jekel; amongst other points he noticed the very great resemblance which there existed between the type-specimens of *Polyphrades cinereus* and *Cherrus nanus*, which he thought ought not to be separated generically, and which could scarcely be even separated as distinct species. In return, M. Jekel favoured Mr. Waterhouse with some observations upon the species of *Cherrus* and *Polyphrades*, which he regards as of sufficient interest to be laid before the Society.

The following is M. Jekel's communication:—

"Genera *Cherrus* and *Polyphrades*.—This is a very interesting case, which, after many troublesome efforts, I ascertained about two years ago, in studying the new species of Germar—*Cherrus nitidilabris*, of the '*Fauna Novæ Adelaidiæ*.' I do not know whether I spoke to you on the subject last summer, but I had been puzzled as you are now. My decision was as follows:—

"1. Schönherr described *Cherrus nanus* in vol. i., doubting, in a note, as to its being a true *Cherrus*, and at that time he knew only this species as belonging to the *Cherri-form* beetles.

"2. In vol. v., when reviewing his genus *Cherrus*, he no longer had by him the *Cherrus nanus*, and when he there established his new genus *Polyphrades*, he did not sufficiently recollect the characters of that species, which, as I have said, he originally doubted as being a true *Cherrus*. He then described a large species of *Polyphrades* under the name *cinereus*, a species very closely allied to *Cherrus nanus*, but which may be distinguished by its having the suture cariniform behind, a character wanting in *Cherrus nanus* and *C. nitidilabris*. I possess, however, two other undescribed species with the same character.

"These species might be divided into two sections, which I am certain are not founded upon sexual characters, since I possess both sexes of some of them.

"1. *Elytrorum sutura postice elevato-carinata*; including *Ch. cinereus*, *Schönherr*, and two new species.

"2. *Elytrorum sutura plana*—*Ch. nanus*, *Schö.*, *Ch. nitidilabris*, *Germ.*, *Ch. paganus*, *Schö.* They all differ somewhat in the structure of the rostrum and antennæ from *P. laticollis*, *P. argentarius*, &c., but they scarcely "should constitute a distinct genus."—*J. W. D.*

SOCIETY OF BRITISH ENTOMOLOGISTS.

December 6, 1853.—Mr. H. HARDING, President, in the chair.

The President exhibited some specimens of *Speranza conspicuaria*, and observed that this insect was comparatively common at Darenth and Birch Woods some years back, but had now quite disappeared from those localities.

The President next presented a box of insects for the Cabinet from a friend.

The members present were then entertained by the exhibition of a number of entomological objects under the achromatic microscope.

January 3, 1854, Anniversary Meeting. — Mr. H. HARDING, President, in the chair.

The President exhibited the pupa and food of *Depressaria rotundella*, fed on *Echium vulgare*; likewise specimens of *Depressaria Alstrœmeriana*, fed on the same. Mr. Stainton says the food was not before known.

Mr. Dalman exhibited specimens of *Ectinus aterrimus*, taken near Deal.

The Secretary then read his Report for the past year.

The President then delivered an Address on the State and Prospects of the Society, and on Entomology generally; said he was very glad to hear from the Report, that the Society was free from debt, and that the number of insects in the Cabinet had increased principally by means of presents, and that although the Society had not increased very rapidly in members it had added to its number; and it gave him much pleasure to see it was in every respect in a thriving condition: he then proceeded to give a retrospect of the past year, entomologically considered; remarking that although 1853, taken as a whole, had been cold and wet, and although everything was very backward, so much so, that many of the early insects were two months behind the usual time, as was noticed in the monthly reports (published in the 'Zoologist'), and was more fully described by a writer in the same periodical, page 4129, who there remarks that *Semiophora gothica*, which ought to be out in March, he took in July: nevertheless, the year had been a good one for entomologists, thus verifying the adage, that a bad beginning sometimes makes a good ending. Although no new localities had been worked that he was aware of, many rare insects had turned up in Hampshire, and particularly in Scotland, and one or two new things in Lepidoptera. On the southern coast the President had himself taken *Anerastia Farrella* and *Exæretia Allisella*, an entirely new locality for both these Micro-Lepidoptera. Some rare Coleoptera had been taken in the same locality, among which he would particularly

mention *Helops pallidus* and *Ectinus aterrimus*. In Hymenoptera, particularly among the Ichneumonidæ, the President observed that his friend Mr. Desvignes, informed him that he had made some valuable discoveries, and he announced that he intended to follow up these researches more fully during the approaching season. Again, in Micro-Lepidoptera much has been done, but much more remained to be done; he, for one, fully intended to be a labourer in the vineyard, and he hoped that all those who heard him would assist in the cause. On the whole, he believed that entomologists had reason to congratulate themselves on the produce of the year 1853.

In the report of the November meeting, at the end of the remarks about *Elachista Cerussella*, read the dark one or male is only to be obtained by breeding: Mr. Harding informs me the female is common in the fens.—*J. T. N.*

ZOOLOGICAL SOCIETY OF LONDON.

January 24, 1854.—Dr. Crisp made the following exhibitions.

Great Gray Shrike.

A gray shrike (*Lanius excubitor*), which was shot in the eastern part of Suffolk, in October last. Mr. Bartlett, on examining the bird soon after it was shot, thought it was the American species. On comparing its anatomy with that of the red-backed shrike (*L. collurio*), the only important difference was in the weight of the brain. Thus the brains of two red-backed shrikes examined, weighed 12 and 13 grains; the weight of their bodies being 1 oz. 160 grs., and 1 oz. 185 grs. The weight of the body of the gray shrike was 2 oz. 80 grains; of the brain 59 grs.; forming a somewhat remarkable contrast. The gizzard of the last-mentioned bird contained a dung-beetle and a grasshopper.

Peregrine Falcon.

A peregrine falcon (*Falco Peregrinus*), also shot in the eastern part of Suffolk, in December last. The bird was very muscular and fat. Its weight 2 lbs. 5 oz.; whilst the weight of another dissected, that had been kept in confinement, was only 1 lb. 7 oz. Of two goshawks (*F. palumbarius*), dissected last year, the first weighed 2 lbs. 4 oz., the second 2 lbs. 5 oz. The body of the common buzzard (*Buteo vulgaris*), 1 lb. 8 oz. The chief motive for the exhibition of this bird was to show the tarsal muscles, which although of large size, more especially the flexor of the hind toes, were small, when compared with those of the fruit-eating pigeons, particularly the nutmeg (*S. aenea*), exhibited at the Society in December last.

Specimens of Filaria.

Two specimens of worms (*Filaria*), from the lungs and heart of the peregrine falcons mentioned above. The *Filaria* in the cellular tissue at the root of the great vessels of the heart were five or six inches long, and the specimen was believed by the author to have been unique. A large number of *Ascarides*, two inches in length, from the stomach of the common buzzard (*B. vulgaris*), wild. In the stomach were also skeletons of two small birds, the bones being denuded of their flesh by the

gastric juice. Dr. Crisp thought the fact worthy of notice, that the bones should be expelled from the mouth of the bird and the worms be retained.

Œsophagus and Stomach of the Heron.

The Œsophagus and stomach of the common heron (*Ardea cinerea*), distended with air for the purpose of showing the large size of the former, the diameter of which (when distended) measured 2 inches. The stomach contained the skin, tail, and other bones of a large rat. The preparation afforded a beautiful example of the power of the gastric juice, which had by its chemical action alone removed the flesh from the bones. The bird in question was a very large specimen. It weighed 4 lbs. 1 oz., and measured from the tip of each wing 6 feet. The weight of two others dissected was 3 lbs. 13 oz., and 3 lbs. 8 oz.

The following communications from Dr. Edwards Crisp, illustrated by drawings and preparations, were read:—

Anatomy of the Great Bustard.

“On some points relating to the Anatomy of the Great Bustard (*Otis tarda*), more especially on the (so-called) Neck-pouch.”

During the last eighteen months I have had an opportunity of examining three of these birds, two females about eighteen months old, and a male aged about two years and six months. The weight of the male bird was 12 lbs.; of the females 6 lbs., and 7 lbs. 12 oz. I select the two last birds dissected (male and female), for the purpose of elucidating such parts of the visceral anatomy as, I believe, have not been before described, in the same manner. I may premise that the male bird (in the Society's collection) died during the recent cold weather from a broken leg (December, 1853), and was excessively fat, more so than any gallinaceous bird I have before examined. The fat in the pelvis was hard, white, and solid, containing a good deal of stearine, and weighed 3 oz. 320 grs. The morbid appearances in the female were very remarkable, and as far as I know, unique. The abdomen was enormously distended with a hard tumor, which I found to be the gizzard immensely enlarged. On cutting into it, it was seen to be distended with tough grass, dry and in the form of a ball. The parietes of the gizzard were thin, and the muscular character of the organ nearly lost. In fact, it was a gizzard converted into a stomach, by stretching. The contrast between the gizzards of these two birds (before the Society) was very remarkable. The viscera weighed as follows:—

	Male.		Female.	
Heart	2 oz.	21 grs.	1 oz.	208 grs.
Lungs	1 "	240 "		420 "
Liver	4 "	340 "	6 "	400 "
Spleen		24 "		62 "
Pancreas		31 "		84 "
Kidney		380 "		400 "
Length of Alimentary Canal	7 feet 3 inches.		8 feet 7 inches.	

The difference in the weight of the viscera may readily be accounted for by the mode of death.

In the measurement of the alimentary canal the appendices are included; in the male bird the two were 24 inches long; in the female 30 inches. The brain of the

male weighed 151 grains. I will only allude to a few points connected with the anatomy of this bird: probably they have been before noticed, but I have not met with any account of them.

Skeleton.—The head broad: orbital foramen large: the bones generally large and heavy (comparatively), as in most ground birds: cervical vertebræ 14; dorsal vertebræ 7: ribs 7: depth of sternum $2\frac{1}{2}$ inches: length 7 inches; breadth 4 inches: upper part of chest wide.

Tongue serrated laterally: os hyoides $3\frac{1}{2}$ inches long: opening of glottis large: trachea voluminous: length 10 inches; rings entire, three bony rings at the bifurcation of each bronchus. Œsophagus capacious: pro-ventricular glands much developed and of an oblong shape. Gizzard less muscular than in other gallinaceous birds; cuticular lining tough and corrugated. The structure of the gizzard shows that the bird is partly an insect-feeder.* Heart large and pointed; length from base to apex 3 inches 4 lines; thickness of parieties of the left ventricle 7 lines; of the right ventricle $1\frac{1}{2}$ line; auricles covered with fat. Liver: the lobes very obtuse; no gall-bladder. Spleen of a rounded form, like that of most gallinaceous birds. Pancreas bilobed. Kidney very large; the lowest lobe the most voluminous.

The chief points of difference between this and the other gallinaceous birds, excepting the Struthionidæ, are the thinness of the gizzard, and the greater size of the eye, ear, and nostril. But my object in bringing the anatomy of this bird before the Society, is in reference to the faucial pouch (so-called), figured in Mr. Yarrell's 'British Birds,' 1843, and in Professor Owen's article on "Birds," 'Cyclopædia of Anatomy and Physiology.' I copy the supposed discovery of this pouch from Mr. Yarrell's 'British Birds,' 1843, vol. ii. p. 369:—"Dr. James Douglas, of the College of Physicians first discovered it. It is a pouch or bag to hold fresh water, which supplies the bird in dry places when distant from water: entrance between the under-side of the bill. I poured into this bag when the head was cut off nine pints of water."

In a communication made to this Society by Col. Sykes (Oct. 9, 1832, "Proceedings"), on the *Otis nigriceps*, he says, "the male bird is provided with the gular pouch common to the *Otis tarda*." Professor Owen told me this morning, that "he did not now believe in the existence of this pouch, that he had relied upon the statements of others, and that Mr. Yarrell also disbelieves in its presence."

On a careful dissection of the male bird, I find a thin membrane covering the whole length of the trachea; attached to the os hyoides above, to the œsophagus and cervical vertebræ behind, and to the clavicles and sternum below; its attachment to the trachea in front is very loose, and a probe can readily be passed between it and the trachea, and probably if air or water were introduced under it, a bag might easily be formed, but it has no connexion with the mouth or pharynx, nor can I conceive that it could be used for the purpose assigned to it, for if filled with water, it would materially interfere with the functions of the trachea and œsophagus. The presence of this membrane may perhaps account for the statement, that this male bird is provided with a bag to contain water during the breeding-season. I do not deny the existence of such a bag, but I think its presence, in any case, is very doubtful.

* Mr. Frazer, who has been a long time in Africa, in reference to this remark, informed me, after the meeting, that the food of the *Otis Hobara* consists chiefly of grasshoppers.

Professor Owen, in his article on "Birds," above-mentioned, refers to analogous pouches in the pelican, rook, and swift, but I think these receptacles for food bear no resemblance to the supposed faucial pouch; and it must be remarked that these are not peculiar to the male bird. In my dissection of the females I did not examine the neck, but it will be interesting hereafter to ascertain whether the membrane I have described exists in the female bustards, and in other species of birds.*

I have also examined the preparation in the Museum of the College of Surgeons (772, Q.), alluded to by Mr. Yarrell, and prepared by Professor Owen in 1848, which clearly shows that there is no connexion with the pharynx and this supposed gular pouch. Mr. Yarrell, in his paper, speaks of a thin membrane over the windpipe.

On the Anatomy of the Viscera and other parts of the American Tapir,
(*Tapirus Americanus*).

I have had an opportunity of dissecting three of these animals that have died at the gardens of the Society during the last eighteen months, and have taken sketches of the viscera and of other parts (before the Society), which appeared to me to offer points of special interest. The subjoined table gives in a short space the cause of death; the supposed weight; the length of the animals, and of the alimentary canal, as well as the weight of the viscera. The examinations were conducted by myself, and the organs weighed by steel-yards, accurately tested.

Male, No. 1.	Female, No. 2.	Male, young, No. 3.
Age..... 5 years.	5 years.	about 3 years.
Weight..... about 4 cwt.	about 3½ cwt.	about 140 lbs.
Weight of Viscera.		
Lungs..... 4 lbs.	6 lbs. 6 oz.	2 lbs. 4 oz.
Heart..... 2 „ 12 oz.	3 „ 6 „	0 „ 13 „
Liver..... 4 „	6 „ 4 „	3 „ 15 „
Spleen..... 1 „ 13 „	2 „ 12 „	0 „ 8 „
Kidney..... 0 „ 13 „	0 „ 8 „	0 „ 7 „
Length of Alimentary Canal...62 feet.	72 feet.	46 feet.
	Length . 6 ft. 5 in.	Length 4 ft. 5 in.
	Gut..... 4 ft. 10 in.	
	Brain-symptoms,	Inflammation of
Died of perforation of stomach, from ulceration.	from diseased kidney, probably.	mucous membrane of bowels.

Mr. Yarrell, in the 'Zoological Journal,' (1828, 1829, p. 210), has given an account of the dissection of a small American tapir, about twelve months old, that died at the Regent's Park Gardens. In this animal the small intestines were only 21 feet. Mr. Yarrell refers to Sir E. Home's account of the Sumatran tapir in the 'Philosophical Transactions,' 1821, and, on comparison, he infers that in the latter animal the stomach is large, the cœcum small, and the intestinal canal very long;

* Since this paper was read, I have seen the very interesting communication of Mr. Yarrell upon this subject in the 'Transactions of the Linnean Society,' 1853; to this paper I refer the reader for much interesting information respecting this bird.

whilst in the American tapir the stomach is small, the intestines of moderate length, and the cœcum large; but I copy the subjoined from the paper in question:—

"The length of the tapir of Sumatra is 8 feet: whole length of its intestinal canal 89 feet 6 inches. Proportion as 11 to 1.

"Length of the American tapir 4 feet: whole length of its intestinal canal 18 feet. Proportion as 7 to 1."

It is scarcely necessary to add that the foregoing comparison does not hold good, and that the differences pointed out do not really exist. Mr. Yarrell laboured under the disadvantage of drawing his inferences from a very young animal, and of being misled to some extent by the paper of Sir E. Home.

I have selected the viscera of the female for the purpose of examination; of these I took especial notice. No important difference was observed in the three, except in those parts arising from peculiarities of sex.

Weight of the brain 7 oz. 384 grs. Cerebrum 6 oz. 354 grs. Cerebellum 1 oz. 30 grs. Corpore striata beautifully marbled with gray and white matter. The eye small, of a bluish colour, and 18 lines in diameter. The anterior part of the tongue thinly studded with small, round, transparent papillæ; the back part velvety. Trachea large; rings wide; a membranous junction at the posterior part one inch in length. Lungs, the right trilobed, the left divided into two lobes. Heart large, and the parietes of the left ventricle very thick. Length from base to apex $8\frac{1}{4}$ inches. Liver five-lobed, with five appendages. No gall-bladder. Stomach 19 inches in length, and undivided; no rugæ when distended. Œsophagus: lining membrane in longitudinal folds. The lining membrane of the duodenum and jejunum of a velvety appearance. The ileum contained numerous patches of Peyer's glands; these were of an oblong shape: all of them single, with an intervening space of five or six inches. The cœcum large, and its lining membrane rugose. The kidney, in shape, resembled that of the pig. The bladder large, when half full it measured 9 inches, and would hold about three pints of fluid. The spleen long and lax, measuring one yard and two inches; the vein contained nearly a hundred openings, and near its mouth were *two valves for the purpose of preventing the regurgitation of the blood*. These valves were present in all, and I believe the discovery of these valves, in a certain class of animals only, will serve much hereafter to elucidate the function of this organ. Organs of generation: the vagina 10 inches in length, with large transverse rugæ in the mucous membrane. The os uteri small, with transverse opening. The uterus consists of a body and two cornua; the body 3 inches, and each cornu 13 inches. The ovaries large.

I must reserve other parts of the anatomy of this animal for a future paper, when I purpose making a comparison between the organs of the tapir and those of animals of the same class. I will, however, in conclusion, allude to two points of especial interest, viz., the skin and the levator muscles of the snout.

The skin in many parts is seven or eight lines in thickness. The crest on the neck is formed of dense cellular tissue more than an inch in depth, and nearly equals in hardness the skin of the rhinoceros. Under the microscope, I found it to consist chiefly of fibrous tissue, with many fat globules. The levator muscles of the snout, by which the animal is enabled to lift his nose, are very remarkable; they consist of two muscles, which arise by a broad and rather fleshy expansion from the nasal, superior maxillary and lachrymal bones; they then form cylindrical, fleshy bodies, ending in long, narrow tendons, which are inserted into the skin of the nose, about half an inch

from its extremity. The animal is said to take its food chiefly at night, and it is probable that the great mobility of its snout and nostril, enables it to obtain its food with greater facility.

GREENWICH NATURAL-HISTORY SOCIETY.

November 26, 1853.—GEORGE BUSK, Esq., F.R.S., President, in the chair.

Quadrumana of the New and Old World.

A paper was read intituled, "A Comparison between the *Quadrumana* of the New and Old World, with especial reference to their Nasal Peculiarities," by Cuthbert Colingwood, M.A., F.L.S., Hon. Soc.

The author commenced with a brief review of the classification and geographical distribution of the *Quadrumana*, pointing out and illustrating the chief characteristic distinctions between the Old and New World Families; namely:—1. Their comparative size. 2. The presence or absence of cheek-pouches. 3. The development of the tail. 4. Their dental peculiarities. 5. The degree of opposability of the thumb. He also laid particular stress on the great distinction founded by Geoffroy St. Hilaire on the width of the nasal septum and the aspect of the nostrils: and then proceeded to examine each of these nasal characters separately, and to test several species of *Quadrumana* by the definitions which St. Hilaire has himself given of the terms *Catarrhini* and *Platyrrhini*, in order to show that they are of by no means universal application; but that, on the contrary, the description of a *Catarrhine* monkey would apply perfectly to some of the *Platyrrhine* group, and that of the *Platyrrhini* to some *Catarrhini*. The most marked examples adduced as exceptional in support of this assertion were some of the *Colobi*, especially *Colobus Guereza* among the Old World, and the whole genus *Brachyteles (Eriodes)* amongst the New World *Quadrumana*. In all these, it was shown that both the characters involved in the definitions above referred to, were misapplied; and that, in several other instances, one or other of these characters was reversed.

The author then called attention to a character which, in his opinion, would unite all these exceptional cases, and define the boundaries of the *Catarrhine* and *Platyrrhine* groups much more perfectly, and would, at the same time, have the advantage of even greater simplicity, since it would involve only one element. This character, stated in the fewest words, is as follows:—

Simia Catarrhini. Lowermost angles of the nostrils pointing outwards.

Simia Platyrrhini. Lowermost angles of the nostrils pointing inwards.

And it was found that this character applied as perfectly to the cases before referred to, in which both St. Hilaire's characters were reversed, as it does to the mass of the species; because it depends not upon the width of the nasal septum, but upon its form, which is that of a wedge in the *Catarrhini*, but of an hour-glass-shape in the *Platyrrhini*.

This paper was illustrated by osteological preparations from the Museum of Guy's Hospital, and by diagrams.

NOTICES OF NEW BOOKS.

'Transactions of the Entomological Society of London.' New Series.
Vol. II., Part 7. 8vo., 48 pages of letter-press, 4 plates. *Price*
3s. 6d. London: Longman. 1854.

THE contents of this part are as under:—

'Contributions to the Natural History of British Micro-Lepidoptera.' By J. W. Douglas, Esq. (Concluded).

'Monograph of the Genus Cryptocerus, belonging to the Group Cryptoceridæ, Family Myrmicidæ, Division Hymenoptera Heterogyna.' By F. Smith, Esq.

'A Revision of the Synonymy of the British Species of the Coleopterous Genera Hydrochus and Ochthebius.' By G. R. Waterhouse, Esq., F.L.S.

'Descriptions of some new Species of Coleoptera from China and Ceylon.' By J. O. Westwood, Esq., F.L.S., &c.

Of Mr. Douglas's paper we have already spoken in terms of unmingled commendation. Mr. Smith's Monograph of *Cryptocerus* is a paper of very high character; and the careful manner in which the species are described, the synonymes worked out, and the specimens figured, do the author great credit. The number of species previously known was twenty; to these Mr. Smith has added fifteen new ones, making a total of thirty-five, twenty-four of which are figured.

'The Annals and Magazine of Natural History.' No. 72, dated December, 1853; *price* 5s.: and No. 73, dated January, 1854; *price* 2s. 6d. London: Taylor & Francis, Red Lion Court, Fleet Street.

The papers in No. 72 are intitled:—

'On the British Tritons.' By John Higginbottom, F.R.S.

'Notes on some new or little-known Marine Animals.' By P. H. Gosse, A.L.S.

'Descriptions of some undescribed Species of Reptiles collected by Dr. Joseph Hooker in the Khassia Mountains, East Bengal and Sikkim Himalaya.' By J. E. Gray, Ph.D., F.R.S., V.P.Z.S., P.B.S., &c.

'On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.' By Thomas Williams, M.D. Lond.

'On Blood Rain, (*Palmella prodigiosa*, Mont.)' By H. O. Stephens, Esq.

'Descriptions of two new Genera (*Pfeifferia* and *Janella*) of Land Mollusca.' By J. E. Gray, Ph.D., F.R.S., V.P.Z.S.

'Notes on the Habits of Bivalve Shell Fish.' By S. P. Woodward.

'Centuries of North American Fungi.' By the Rev. M. J. Berkeley, M.A., F.L.S., and the Rev. M. A. Curtis, D.D.

'Note on the Transverse Processes of the Two-toothed Dolphin, (*Hyperoodon bidens*). By Professor Owen, F.R.S., &c.

'Remarks on *Libellula Brodiei*, *Buckman*, a Fossil Insect from the Upper Lias of Dumbleton, Gloucestershire.' By Professor Buckman, F.G.S., F.L.S.

'On *Gallionella ferruginea*, *Ehr.*' By J. W. Griffith, M.D., F.L.S.

Bibliographical Notices: — 'The Botany of the Eastern Borders, with the Popular Names and Uses of the Plants.' By G. Johnstone, M.D. 'The Handbook of British Ferns.' By T. Moore, F.L.S., &c. 'Beitrag zur Mycologie.' Von G. Fresenius, M.D. 'A Monograph of the Subclass Cirripedia.' By Charles Darwin, F.R.S., F.G.S.

Proceedings of Societies: — Zoological—Linnean.

Miscellaneous: — On the Mode of Reproduction and Development in the various Groups of Zoophytes and Mollusca; by M. Gegenbaur: extracted from the 'Comptes Rendus' for September 26, 1853, p. 493. On the Teeth of *Testacellus* and *Glandina*; by J. E. Gray, Ph.D., &c. On the Structure of the Retina in Man; by Professors Kolliker and H. Müller: extracted from the 'Comptes Rendus' for Sept. 26, 1853, p. 488. Discovery in the Human Body of a Substance giving the same Chemical Reactions as Cellulose; by M. Virchow: extracted from the 'Comptes Rendus,' l. c. 492.

Mr. Higginbottom's paper on the British Tritons is one which will be studied with pleasure and profit by every herpetologist. The reduction of our British species to three, will meet with general acceptance: the renaming of these three species will, we think and hope, be as generally rejected. The new names proposed by Mr. Higginbottom, with their equivalents in Bell's 'Reptiles,' and in authors which have the claim of priority, may be expressed as under: —

Mr. Higginbottom's proposed Names.	Names employed in the 2nd edition of Bell's 'Reptiles.'	Names which have the claim of priority.
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Triton asper, H.	= { Triton cristatus, Triton Bibronii, }	= [Triton] palustris, L.
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Triton lævis, H.	= Lissotriton punctatus	= [Triton] aquaticus, L.
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Triton minor, H.	= Lissotriton palmipes	= [Triton] palmipes, Dd.
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The very discussion of a name on the ground that it might be exchanged for a prettier, a more descriptive, or a more classical name, implies the possession of a choice which is vested in no man. We are perfectly open to conviction on this, and, we trust, on every other subject; but the law of priority appears to us so binding and so beneficial in its working, that no argument we have hitherto heard induces in us the slightest disposition to question its propriety.

At the present moment, we hold that no received name can be rejected, even in favour of a better. But were we to renounce this *primâ facie* objection to new names, and confine ourselves simply to the meaning of the new names now under consideration, we think it would be utterly impossible to select three Latin words less distinctive or descriptive of the three species. The word "asper" conveys to any one conversant with the Latin tongue the idea of a property which none of our newts possess; the word "lævis" does not in any way distinguish the species so called from the next species, "minor," and several others which are equally "smooth;" and the name "minor" simply expresses comparative smallness, without suggesting the object with which the animal so called is to be compared. To ascend from names to the objects themselves, we may state that Mr. Higginbottom has drawn from actual observation, eight conclusions, which we unhesitatingly accept as highly probable and extremely valuable, even while we are prepared carefully and candidly to weigh all counter evidence. These conclusions are the following:—

"1. That there are only two species of Triton in the midland counties of England.

"2. That the tadpole of the Triton remains in the water until the branchiæ are absorbed, and the legs become sufficiently strong to enable it to leave that element, and does not usually return to it again until the expiration of the third year.

"3. That during three years it is a land animal, in a state of activity in the summer, and of hibernation during the winter.

"4. That the Triton is three years before it propagates its species, and four years in arriving at its full growth.

"5. That it revisits the water in the spring for the purpose of reproduction, and leaves it early in autumn.

"6. That fecundation is accomplished through the medium of water, and not by actual contact.

"7. That a very dry or a very wet situation are both fatal to the Triton when in a state of hibernation.

"8. That the habits and changes of the new Triton are in accordance with the other species."—P. 383.

The third of these propositions, namely, that the Triton, during his land life, is in a state of activity in the summer and of torpidity in the winter, must be regarded as rather more comparative than positive : if you turn up a Triton from under a stone, or extract him from some crevice between bricks in your cellar, you find him lethargic in every month of the year. Here is one on this sheet of paper ; he is sprawling on his back : now he has regained his natural position ; not agile indeed, yet not torpid : and the weather is cold ; the ponds are frozen ; Fahrenheit is at 26° : in summer he would be more lively, perhaps, but even then rather a slow reptile.

Note on the Extraordinary Torpidity of a Bat. By the Rev.
ALFRED CHARLES SMITH, M.A.

WHILE effecting some repairs in the pavement of the aisle of my church a short time since, the masons found it necessary to remove some bricks from the solid wall of an adjacent vault, in order the better to adjust an iron bar intended to support the superincumbent flag-stone. It seems that one or two bricks being removed, and several large and handsome coffins being exposed to view, curiosity tempted one of the workmen to reach his hand in with a lighted candle, in order to see the names and dates on the coffins ; the result of which investigation showed that the last coffin was placed there in 1748. During this search I entered the church, just in time to witness the extreme surprise, and the no little consternation of the man, whose hand had suddenly come in contact with a bat, suspended from the roof of the vault. The bat was soon brought to light, and, in its half-torpid state, placed in my hand. We then proceeded to make a very minute examination of this vault with a lighted candle, in order to discover, if possible, by what means the bat could have penetrated to its resting-place : but, although our search was very careful and long-continued, we failed to discover the smallest crack or crevice in which a pin could be thrust. The roof was an arch of brick, surmounted by flag-stones ; the sides were solid walls of masonry, bearing no appearance internally of decay ; and the position of the vault was very near the centre of the church : so that I was much puzzled to account for the occurrence of the bat in a place apparently herme-

tically sealed for above a hundred years : and knew not how to combat the opinion of the workmen, that it must have been entombed there alive since the year 1748.

I now proceeded to institute inquiries regarding the vault in which the bat was found. The marble monument above, recorded the names of an old Wiltshire family long since extinct in these parts, and the dates of the three coffins below, corroborating the statement of the brass plate, that the individual last buried died A. D. 1748. Several old men in the parish remembered an adjacent vault being opened, when they were boys, nearly sixty years since ; but all positively denied that the vault in question had ever been opened in their lives : and one, a very old man, formerly clerk, and whose then residence abutted on the church-yard, was very emphatic on this point. So that I am constrained to believe that the vault has remained untouched since it received its last occupant a hundred and six years ago : and I am the more convinced of this from the excessive freshness of the last coffin, the brass plate and nails of which were as bright, and its whole appearance as new, as if it had been placed there but yesterday, which would not have been the case had the external air been admitted at any time since the vault was closed.

During the time of the examination of the vault, the bat was held in my hand, and above an hour must have elapsed since its capture before I was enabled to take it to the Rectory, and place it under an inverted glass : by this time the warmth of my hand had considerably revived it, and it wandered round its prison, snuffing about with its curious nose, and standing up, and trying to hook itself on to the smooth glass, which baffled all its attempts. As it obstinately refused to eat small pieces of chopped meat, with which I tempted it to break its fast, which may have continued a hundred and six years, and after which I should have imagined it to be ravenous ; and as it lay on its side, apparently in a dying state, humanity urged me to give it a chance of life, by restoring it to liberty, and I accordingly carried it to the garden, where I placed it upon the turf, and watched its movements. At first it clung to the blades of grass, and shivered a good deal ; presently it fluttered along the ground ; soon it rose upon wing, though in an awkward manner, and although it sank several times, as if about to fall to the ground, and as if it had not found the use of its wings (which might have been a little stiff for want of exercise, if they had been closed above a hundred years), it passed behind a clump of trees, and I saw it no more : and then I began to regret, when too late, that I had not made more efforts to keep it alive and watch its

recovery. I know little of the different species of bats, but from its diminutive size, and extremely long ears, should imagine it to be the *Vespertilio auritus* of Gilbert White.

Now, if the hypothesis be deemed absurd that the bat had been immured in the vault since 1748, how then are we to account for its presence there? For although I am aware that a bat, and especially one of the smallest species, would creep through a very small chink or crevice, yet the evidence of my own senses, after a very close examination, convinces me that not even the smallest crack existed between the bricks of the vault: and I think the evidence no less conclusive that the vault has remained untouched for a great number of years. Again, notwithstanding the disbelief of some, it is very generally acknowledged that toads do occasionally exist in blocks of stone and in timber; and the material in which they are inclosed, having gradually formed around them, they must necessarily have been entombed, in some well-authenticated cases, for a very long period of time. Why then, I ask, should we deny that to be possible with the bat, which we so readily concede to be an occurrence by no means unusual with the toad? I own, that taking all these things into account, and finding no other possible solution for the mystery, I came to the conclusion, after mature deliberation, that the bat had been entombed in the vault since it last was opened in the year 1748. That impression has increased upon longer reflection, and has been further strengthened almost into certainty, from the perusal of a very interesting and very similar case, recorded by the Rev. P. G. Bartlett in an early volume of the '*Zoologist*,' (Zool. 613). That gentleman states, that on opening a vault which had been closed for twenty-one years, a bat was discovered in a torpid state; that he himself made a very careful search about the vault, and was unable to discover any crack through which the smallest bat could have crept; that the vault was surrounded with brick-work; the entrance was bricked up, and over the steps was placed a close-fitting slab; and that he could come to no other conclusion than that the bat had been inclosed there for twenty-one years. I confess that I quite agree in opinion with Mr. Bartlett, and believe that the bat discovered in the vault in Bishopsbourne church, crept in on the occasion of its last opening; and so, in like manner with the one found in my own church: for although there is unquestionably a vast difference between twenty-one and a hundred and six years, yet if we can establish the fact of a bat remaining torpid for the shorter period, I find no difficulty in understanding that a sleep which could endure so long as that did, might

be protracted to a far longer period. It is most probable that many will differ from me in opinion, and perhaps some will ridicule the idea : if they can discover any other probable or even possible means of accounting for the presence of the bat in the vault, exclusive of a crack or chink in it, or of its having been opened within the memory of living man, both of which views I firmly oppose, I shall feel greatly obliged by their stating their opinions in the 'Zoologist : ' meanwhile I hold to my belief, that the bat had been there for not less than *one hundred and six years !*

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
February 18, 1854.

Note on the habits of Lymnaea stagnalis.—This fresh-water mollusk is long-lived in confinement. I have had some in glass jars since the early part of last summer. To-day I had a good opportunity of observing their mode of respiration. As one of them lay floating on the surface of the water, upheld by the air in its pulmonary sac, and by its inverted hollowed boat-like foot, I dropped a morsel of table salt on the centre of the latter. Instantly the animal retracted, falling heavily to the bottom, giving out while doing so, and for some seconds after, a stream of air from its breathing orifice under the mantle on the edge of the last whorl of the shell. It lay at the bottom for a few minutes in a kind of convulsion, projecting its one tooth to an unusual extent. It then became an interesting thing to notice how anxious it appeared to reach the surface for more air, how slowly it crept up the side of the glass, and how many times it fell down again, in consequence of its greater specific gravity than when under its usual conditions. At length it attained the top of the water. Here, instead of conforming to its usual habit of throwing itself, freely detached, swimming foot upward, as at first described, it crept further up the glass, half-an-inch above the water-line, in fact, until it had exposed its respiratory hole to the air. Then it took in a supply of the elastic fluid, the edge of the mantle opening with a slight, but distinct sound while in the act, and resumed its ordinary functions, remaining detached at the surface, as before. The evident reason for thus departing from its usual course, was, that its instinct led it to be aware that its weight was increased by the previous expulsion of air, and that it had lost its flotive powers. I repeated the experiment in the course of an hour, but not with quite the same result as before, for now the animal was so much weakened by its previous treatment, that I had to expose it to the atmosphere to save its life. It is now (February 4th) quite healthy and active. These observations give me much encouragement to proceed in minute and constant examinations, even when the subjects of them are the commonest inhabitants of our ditches.—*William Alford Lloyd ; St. John's Square, Clerkenwell, London, February 4, 1854.*

Notes on the Birds of Italy and Sicily, made in 1853.

By ROBERT BIRKBECK, Esq.

HAVING observed a list of the birds noticed by Mr. Sclater, in the market at Rome, in your last number (Zool. 4160), I am induced to send some remarks on the birds which I either saw, or procured, in Italy and Sicily, during the early part of last year. There are, as Mr. Sclater justly observes, very few birds to be seen on the Continent, unless long rambles are taken among the mountains and valleys, where many rare and shy birds may be seen. I frequently went with the cacciatori (fowlers) who know their haunts, and from whom may often be collected much interesting information.

I was very sorry to have spent only five weeks in Sicily, as I think it is one of the most interesting places in Europe for Ornithology; its extensive ranges of mountains being an asylum to the birds from the unrelenting cacciatori, who allow them no rest in the plains and gardens.

I was at Rome in May, which is too late in the season, there being most in the market during March and the beginning of April; I procured, however, several rare birds.

I believe that there is no bird-stuffer either in Rome or Florence, and only one in Naples; but there is a very good one in Genoa, where all the birds of Liguria may be obtained. I did not pay so much attention to the Sylviadæ and smaller birds as I did to the Raptores.

The species marked with an asterisk have not been observed in the British Isles.

**Vultur cinereus*. This vulture is occasionally procured in Sicily.

**Aquila brachydactylus*. I skinned two specimens at Rome: in the throat of one of them was a snake four and a half feet long. I also saw several soaring over the Campagna. I bought two at Genoa; they are common in Liguria, in the spring.

**Falco Eleonoræ*. It is sometimes met with in Italy and Sicily.

**Falco tinnunculoides*. I procured one specimen at Messina, and hope to obtain three more from the same place. Rather rare in Sicily.

Falco rufipes. I skinned three at Rome. When I was at Tivoli, I saw a pair of these beautiful hobbies, which had their nest on a tall poplar; they circled over my head, uttering loud shrieks. I procured several in Sicily, where they are generally common, though occasionally very rare.

Pernis apivorus. I skinned a beautiful specimen at Rome.

Noctua Passerina. One of these birds lived in a hole of the wall, opposite our hotel, at Rome, always quitting it before dusk. Rather common.

**Noctua acadica*. There are several of these rare birds in the Museum at Florence, which is very rich in Raptores.

Bubo maximus. I obtained one at Nice. They breed in Liguria. *Scops Aldrovandi*. Common.

Nucifraga caryocatactes. Rather rare in Italy.

**Pyrhocorax alpinus*. I obtained a fine specimen at Genoa. It is common in Liguria.

Coracias garrula. Common in the summer. I observed a pair flying across the Campagna, their wings shining splendidly in the sun.

Oriolus galbula. Very common at Naples, in May.

**Sturnus unicolor*. I procured several skins. It is common in Sicily, Sardinia, Corsica, and the adjacent islands.

Pastor roseus. Not rare in Sicily.

Lanius excubitor. Not rare.

**Lanius meridionalis*. Rare; I could not obtain a specimen of this shrike in Italy.

**Lanius minor*. I obtained one at Messina and one at Genoa.

Lanius rutilus, and *L. Collurio*. Common.

**Muscicapa albicollis*. Not rare.

Turdus saxatilis. I obtained six specimens of this beautiful thrush, which is not rare in Sicily and the South of Italy.

Sylvia suecica. Not very rare.

Alauda cristata. This lark is common, very tame, and may be seen running about on the Campagna, with its crest elevated.

Cuculus glandarius. An occasional wanderer to the south of Italy and Sicily.

Picus martius. Very rare in Sicily. Quite common at Naples in April, though never seen in other months.

Picus viridis. In the Museum at Pisa, I observed three or four specimens with the feathers on the rump and neck quite flame-coloured, and those on the back of a bright yellow, similar to the specimen noticed by Mr. Gurney, in the 'Zoologist,' (4800). Some were brighter in colour than others. I think that they were distinguished as varieties of *P. viridis*.

**Picus medius*. Not uncommon.

**Tichodroma phænicoptera*. This beautiful creeper is not rare in Italy, but I was not fortunate enough to see it alive.

Upupa Epops. Common.

Merops apiaster. Not rare. I skinned one at Rome.

**Merops Savignii.* Occasionally seen amongst the last-mentioned.

**Hirundo rupestris.* Not uncommon in the Ligurian mountains.

When at Nice, in January, on several fine days, I saw some small swallows (like *H. riparia*), hawking for flies, near the sea.

Cypselus alpinus. I saw a great many at Palmero, about March 26th; not rare in Liguria.

**Perdix Francolinus.* Not rare in the two Sicilies.

**Perdix Græca.* Common.

Glareola torquata. Not uncommon. I procured several specimens in Sicily.

Otis tetrax. Common in Sicily: I procured two skins.

Ardea alba. Rare in Sicily.

„ *garzetta.* I obtained one at Naples.

„ *ralloides.* I procured two very fine specimens at the last-mentioned place.

Ibis falcinellus. I saw one flying over head, near Messina, and skinned one at Catania, in Sicily.

ROBERT BIRKBECK.

Keswick, Norwich, January 14, 1854.

Note on two Brown Eagles.—Two brown eagles, from Killarney, have been in the possession of the Rev. H. B. Knox for the last fourteen years till last Sunday, when the more powerful destroyed his companion, picked off all his feathers, and had eaten the flesh from the breast-bone before his cannibalism was detected. They had been fed the day before with a still-born pig, and appeared completely gorged. Stray waifs of all sorts of dead animals have been constantly supplied as parochial perquisites by the parishioners, and there was no suspicion that they had been underfed.—*J. S. Henslow; Hitcham, Suffolk, February 22, 1854.*

Rough-legged Buzzard killed on the North Tyne.—A pair of these irregular migrants have been procured on the North Tyne during the winter. One was shot in November, and the other caught in a trap, towards the end of January last.—*Thomas John Bold; Angus' Court, Bigg Market, Newcastle-on-Tyne, February 7, 1854.*

Carnivorous Propensity of the Great Gray Shrike.—I procured a great gray shrike on the 21st of December last, in the act of carrying a skylark in its feet, which it had flown about with for some time previous to my shooting it. The lark was hardly half an ounce lighter than the shrike.—*H. T. Partridge; Hockham Hall, near Thetford, Norfolk, March 4, 1854.*

Occurrence of the Shore Lark (Alauda alpestris) in Yorkshire.—I have a fine specimen of this rare bird, which was shot at Filey, on the Yorkshire coast, in the early part of March, 1853; a second was seen at the same time, but was not obtained. I

observe in a "List of the Birds of Cumberland," which appeared in a late number (Zool. 4166), that the shore lark is called "common;" this surely must be a mistake: if the bird has occurred in that county, the particulars of its capture would be well worth recording.—*Thomas H. Allis; York, February, 1854.*

Notes on the Ring Ouzel (*Turdus torquatus*), &c.—A specimen of the ring ouzel is in my possession, and was caught by a bird-catcher, of whom I frequently buy birds. Very great numbers of the kestrel (*Falco Tinnunculus*) immigrate here in the autumn; I might have bought any numbers last year at from 3d. each of the bird-catchers. I also procured, from the same source, a fine specimen of the sparrow-hawk (*Falco Nisus*), male, which I have preserved: it is one of the most perfect specimens I have seen. In Chiswick, also, I have procured a specimen of the carrion crow (*Corvus Corone*), which was shot a short time since by a man, who, by the same shot, killed another which was fighting with the one I have. A specimen of the goosander or dun diver (*Mergus merganser*) was also shot at Chiswick, which I have.—*John Dutton; St. Peter's Place, Hammersmith, February 16, 1854.*

Note on the Hawfinch (*Fringilla coccythraustes*).—It is quite common in the vicinity of Chiswick. They frequent the market-gardens, and feed on the stones of fruit, berries, &c. I have six specimens by me, and should be happy to exchange one or two pair (stuffed) for a similar number of the crossbill or pine grosbeak, stuffed, or in the flesh.—*Id.*

Occurrence of the Hawfinch at Oatlands.—On Christmas day I had a hawfinch for some time upon the lawn, picking up the haws under a red thorn tree, and but for its singularly large head, I think it most likely I might have mistaken it for a chaffinch, the male bird of which, in fine summer plumage, it greatly resembled at a little distance.—*W. C. Hewitson; Oatlands, March 4, 1854.*

Note on Abnormal Variations of Plumage in the Common Bulfinch, Common Pheasant, and Red-breasted Merganser.—Last autumn a gentleman presented me with a bulfinch entirely black, which had been found of that colour, in a nest containing three other young birds all of the ordinary colour. This bird has subsequently moulted, and in doing so has totally lost its black colouring, and has assumed the ordinary plumage of the female bulfinch. In the year 1852 my gamekeeper caught in my plantations a hen-pheasant, which, to a considerable extent, had assumed the plumage of the male bird about the head and neck: this bird was placed in a large cage in my garden, and in the course of last autumn quite lost the male plumage it had previously attained, and resumed its ordinary female dress. I lately saw a red-breasted merganser which had been killed on the Norfolk coast, and which was in the female dress, but showed a considerable amount of black plumage about the head and neck. I imagined this to be a young male bird commencing the assumption of the adult dress, but on dissection, I found it to be a female, and without any signs either of disease or exhaustion of the ovarium.—*J. H. Gurney; Easton, Norfolk, January 27, 1854.*

Singular conduct of a Stock Dove.—Mr. Gould has made us acquainted with a bird, which, for its own amusement, builds itself a bower. Mr. Wallace tells me that the cock of the rock will select a piece of open green in the forest, and, in its full dress of gorgeous orange, hold a dance with its companions. I have often seen tame pigeons put themselves in most ludicrous attitudes, and the Tommy Noddy (the puffin) do the same thing; but until this winter I never saw a bird practising gymnastics for its own amusement. The ring and stock doves are sometimes numerous here during

the winter, and I have had dozens together upon the lawn, but being much shot at, they will not readily allow any one to come near them. I was, therefore, one day much surprised to find myself within a few yards of a stock dove, which was so much engrossed by its novel occupation as not to notice my approach. It was busy picking up acorns, one or two of which it swallowed; but placing its head backwards till the crown touched its back, as I have seen storks do, and leaning back at the same time, so far as sometimes to have to raise its wings to maintain its equilibrium, it dropped the acorn over its own tail. This it did repeatedly, till, tired of watching it, I walked close up to it, when it made a very clumsy effort to fly away, and did not recover itself before it had come forcibly in contact with two trees. The bird had the appearance of being intoxicated.—*W. C. Hewitson; Otland, March 4, 1854.*

Note on a Hybrid between a Black Grouse and Pheasant.—To the thirteen examples of the black grouse having bred with the common pheasant, I have now the pleasure of adding a fourteenth. At the beginning of the present month, a bird was shot in a large wood, called "Staunton Springs," near Melbourne, by the keeper in the service of the Earl Ferrers. It came several mornings to feed with a number of pheasants which haunted the wood, and was very tame. Upon examination, I find it to be a hybrid between the [species which I have mentioned. It resembles in form almost precisely that of the bird represented at page 311 of Yarrell's 'British Birds.' It is somewhat pheasant-like in shape, more especially about the head, but has white tips upon the shoulder of the wings, and the legs are partly feathered. The tail is a sort of compromise between those of both birds, being shorter than the pheasant's and longer than that of the grouse, and fan-like in figure. But how can this union of species have taken place? The black game is an entire stranger in these parts, no example, probably, ever having been seen here nor within dozens of miles of us. I should mention that this specimen has been beautifully preserved by Mr. Cook, of Derby, for the Earl Ferrers.—*John J. Briggs; King's Newton, Derby, February 20, 1854.*

Occurrence of the Little Bustard (Otis tetrax, Linn.) in Dorsetshire.—On the 26th of December a fine old female specimen was shot on Fosshill Common, Winfrith, a village situated between Weymouth and Wareham; it was brought to a bird-stuffer, of Weymouth, for preservation. I do not find any record of this bird having hitherto been obtained in the county, with the exception of a notice supplied me by my friend O. Pickard-Cambridge, Esq., of a female, which was shot some years since in a turnip-field, at Warmwell, about five miles from Winfrith: this bird was sent to Bullock's Museum, and from thence to the British Museum.—*William Thompson; Weymouth, February 10, 1854.*

Occurrence of the Little Bustard (Otis tetrax, Linn.) in Lincolnshire.—B. H. Brown, Esq., shot a specimen of the little bustard, in a turnip-field, on Welbourn Heath, Lincolnshire, on the 30th of last January. He brought it to Newark to be mounted, when I had the pleasure of seeing it in the flesh. I may take this opportunity of mentioning that a little bustard was shot within eight miles of Newark, in the county of Nottingham, about eight years ago, by Banks Wright, Esq., of Shelton.—*W. F. Footitt; Newark, Notts, February 3, 1854.*

Occurrence of the Little Bustard in Norfolk.—I had lately the pleasure of examining, in the flesh, a fine male specimen of this rare visitor; shot on the 29th of December, in a turnip-field, on the road leading from Winterton to Yarmouth. This bird was in good condition, the stomach being literally crammed with vegetable matter, apparently fragments of some large leaf, with a rough surface and serrated edge. The

Rev. Richard Lubbock, in his 'Fauna of Norfolk,' observes, that in three instances of the occurrence of this bird coming under his notice, "it has without variation been found in a turnip-field." I find that your correspondent Mr. Rodd, of Penzance, in recording (Zool. 4179) the appearance of several other specimens recently in Cornwall, mentions that the wind had been S. or S.E. for some days; at the time, however, when the present example was procured, and for some days previously, the wind was either N. or N.E.—*H. Stevenson; Norwich, January 28, 1854.*

Occurrence of the Little Bustard in Yorkshire.—A female specimen of the little bustard was shot on the 19th inst., by the Rev. W. Blow, at Goodmanham, on the Yorkshire Wolds. It has been beautifully mounted by Mr. D. Graham, of York.—*Thomas H. Allis; York, February, 1845.*

Occurrence of the Common Bittern (Botaurus stellaris) near Warrington.—A fine male specimen of this bird was shot at Thelwall, on the bank of the Mersey, on the 12th ult., by Mr. James Taylor, and has been presented to the Warrington Museum by Henry Stanton, Esq.—*Nicholas Cooke; Penketh, near Warrington, February, 1854.*

Occurrence of the Common Bittern (Ardea stellaris) at Chiswick.—A fine specimen of the bittern was shot at a place called "Jessop's Eyot," Chiswick, on the 7th of January last, by a man who sold it to me in the flesh; I was also informed by the same person that another was shot by the toll-keeper at Kew Bridge, about the same time, and that he also saw it in the flesh. I believe it is a very rare occurrence for the bird to be met with in this neighbourhood.—*John Dutton; St. Peter's Place, Hammersmith, February 16, 1854.*

Bartram's Sandpiper as a British Bird.—As no further notice has been taken of the sandpiper described some while ago in the 'Zoologist' (Zool. 3330), by Mr. Reid, nor have the conjectures offered at the time been since confirmed, I am induced, in the absence of a better account, to lay before the readers of the 'Zoologist' what information I have obtained on the subject since I have been in Doncaster. His attention once called to the 'American Ornithology,' Mr. Reid soon satisfied himself that his bird could be no other than Bartram's sandpiper, agreeing, as it did, in the most minute particulars, with Wilson's description: and the very remarkable character exhibited in its wedge-shaped tail, leaves no doubt as to the identity of the bird. It is the *Tringa Bartramia* of Wilson, Am. Orn. vol. ii. 353; *Totanus Bartramius* of Temminck, Man. d'Orn. ii. 650, and of Bonaparte, Synop. 325; and is well-figured in Gould's 'Birds of Europe.' The circumstances under which the present individual was found, agree so far exactly with what are said to be its habits in America: and indeed Mr. Barnard, the gentleman who sent the bird to be preserved, was particularly surprised that it should have occurred "so far inland, sitting on a bean-stubble, and in a place near to which there is no water." The locality was near Warwick, not Warrington; and this unique specimen I understand still remains in the possession of R. T. Barnard, Esq., of Kinton Hall, near that city, to whom it was brought in the first instance by the man who shot it. So many of the American *Tringidæ* have already been enrolled as British birds, that the occurrence of one more species cannot be looked upon with much surprise; while in the case before us, the fact that Bartram's sandpiper has for some time been known as a straggler on this side of the Atlantic, will no doubt serve still further to justify its introduction into our Fauna. For this very interesting novelty we are indebted to the discrimination of Mr. Reid, who, when recording its description, felt confident his sandpiper had not

hitherto been recognised as a British bird. — *A. G. More ; Doncaster, February 15, 1854.*

Extraordinary Propensity of a Moorhen.—At the beginning of last July, the keeper having lost several pheasants about three weeks old, from the copse, and having set traps in vain for winged and four-footed vermin, determined to keep watch for the aggressor, when, after some time, a moorhen was seen walking about near the copse; the keeper, supposing that it only came to eat the young pheasants' food, did not shoot it until he saw the moorhen strike a pheasant, which it killed immediately, and devoured all the young bird, except the leg and wing-bones. The remains agreed exactly with those of eight found before. Perfect confidence may be placed in the correctness of this statement. — *H. T. Partridge ; Hockham Hall, near Thetford, Norfolk, March 4, 1854.*

Occurrence of the Turf Scoter (Oidemia perspicillata, Flem.) at Weymouth. — In the month of December, 1853, a specimen of this rare scoter was shot in Weymouth Bay, close to the shore, and between Weymouth and Purton Coast-guard Station. The above specimen is a female; it was very difficult to kill, in consequence of the facility with which it dived. The bird is very nicely preserved by Douglas Legg, of this town, and who has it for sale. — *William Thompson ; Weymouth, February, 1854.*

Note on the Scarcity of Birds on the Continent. — With Mr. Sclater, I was struck with the singular absence of birds on the Continent. In passing up the valley from Pipinsterre to Spa, in excursions about Aix-la-Chapelle, in ascending the Drachenfels, in the valley of the Lahn going to Emms, about Wiesbaden, Schlabach, Schlangenhad, and in excursions to the valley of the Mierg at Baden, though always on the look-out, I saw but few; a hawk every now and then, one or two carrion-crows, and very often six or seven magpies together, apparently busily employed in plotting some mischief; no thrushes, blackbirds, or robins, and not a single skylark between Ostend and Boulogne. The Tythys or black redstart, which Mr. Sclater states to be abundant at Baden, I was not fortunate enough to observe. — *R. Wakefield ; Sussex Place.*

Provincial Names of Birds in Devonshire and Cornwall.—The following are the provincial names of some of the birds in Devonshire and Cornwall which have come under my notice:—The peregrine falcon is called sometimes a "falcon," and sometimes the "blue hawk;" the kestrel, "cress hawk" and "wind-fanner;" kite, "fork-tailed kite;" buzzard, "eagle;" common dipper, "water-crow;" missel-thrush, "holm screech;" fieldfare, "blue birds;" redwing, "winnard" and "windalls;" song thrush, "gray thrush;" hedge accentor, "hedge sparrow;" stonechat, "furzechat;" whitethroat, "whitty beard;" great titmouse, "big hickmull;" blue titmouse, cole titmouse, marsh titmouse, "hickmulls;" long-tailed titmouse, "long-tailed pies;" wagtails, "dishwashers;" common bunting, "bunting lark;" yellow bunting, "gladie;" chaffinch, "chinks," "silver finch," "copper finch;" greenfinch, "green linnet;" common linnet, "fiery linnet;" bullfinch, "hoop;" hooded crow, "market sea crow;" jackdaw, "daw;" green woodpecker, "woodwall;" common creeper, "tree climber;" wren, "tope;" ringed plover, "scanderling;" lapwing, "horniwinks;" oyster-catcher, "sea-pie;" golden plover, "whistling plover;" common sandpiper, "summer snipe;" dunlin, "sanderling;" great crested grebe, "great dabchick;" little grebe, "dabchick;" great northern diver, "loon;" red northern diver, "loon;" common guillemot, "willock" and "murre;" puffin, "sea parrot;" razor-bill, "murre;" all the terns are indiscriminately called "sea swallows;" all the skuas, "Tom Harries." — *Edward Hearle Rodd ; Penzance, February, 1854.*

Suggestions for ascertaining the Causes of Death in Birds and Animals. By W. E. C. NOURSE, M.R.C.S.

EXCEPTING the peculiar subjects of veterinary surgery, systematic attention has not hitherto been paid to the natural causes of death in birds and animals. In the numerous and increasing zoological collections of this country, deaths constantly occur, entailing both vexation and loss upon the owners. In the wild state, also, birds and animals are often found dead without apparent cause, sometimes singly, sometimes in great numbers together. But in neither case are the causes of death much sought for, and if any examination is made, it is conducted on no regular plan, nor are its results preserved for comparison with other instances. Thus knowledge of a very interesting and useful kind runs to waste, and is lost merely for want of being gathered. I would suggest to all naturalists, owners of collections, and others interested in the subject, to omit no opportunity of examining the bodies of animals and birds that die, or that are found recently dead, without obvious cause, and regularly to book the results. I subjoin some notes on the mode of doing so, for the benefit of those gentlemen who may not be conversant with pathology.

1. Observe the outward appearance and condition; whether emaciated or not; any distortions, wounds, bruises, swellings, &c.; the healthiness or otherwise of the skin; the condition of the fur, feathers, or other outward covering; and whether much infested with vermin.

2. The heart is always the first thing to examine internally, as it shows the immediate or physiological cause of death. Note the quantity, colour, and consistence of the blood in each of the four cavities of the heart, naming those cavities separately and successively. As to quantity, whether each cavity is quite full, half full, or empty: as to colour, whether the blood is red or black; and as to consistence, whether it be fluid or coagulated.

This examination, every item of which should be carefully noted down, will determine the proximate cause of death, and point out the immediate physiological condition which killed that creature. For if the cavities of the heart be empty, death has been caused by deficiency of blood, from external or internal hæmorrhage, or from some other direct and immediate drain upon the system. If the cavities of the heart be full, the left auricle and ventricle with red blood, some sudden shock or severe impression on the nervous system

has been the cause of death, such as a blow, a flash of lightning, violent pain from spasm or inflammation, &c. If all four cavities of the heart are gorged with black blood, that creature has died suffocated, whether from drowning, foul air, or other accident, or from disease of the lungs, or a comatose condition of the brain. These are instances of the conclusions which may be drawn from accurate examination of the contents of each of the four cavities of the heart.

Having made out the immediate condition which produced death, we must next seek within the body for whatever may have caused it. And even if the cause has obviously been something external, it will still be instructive to pursue our examination. The heart being now under inspection, should therefore be examined for aneurism, dilatation, valvular disease, or inflammation of any part of it or its investing membrane.

3. The lungs, pleura, bronchial tubes, and larynx should be next examined, for inflammation, effusion, tubercle, &c., and for any mechanical obstruction of the tubes, or of the opening of the wind-pipe.

4. From the top of the larynx, the examination should be carried down the oesophagus into the stomach, looking for inflammation or other disease in passing along. The contents of the stomach, and their condition, should be always carefully noted, and their quantity ascertained either by weight or measure.

5. The liver should be now examined, then the abdominal cavity, peritonæum, intestinal canal, and other organs contained in the abdomen.

6. Lastly, if no cause of death has thus far been discovered, and indeed in every practicable case, examine the brain and spinal cord, especially looking out for signs of inflammation, dark venous congestion, or extravasation of blood.

This rough sketch of the things to be observed in examining any dead creature, may serve to guide those who have not had practical experience in such manipulations; for, though very incomplete, it hardly permits any ordinary cause of death among the lower animals to escape detection. And some such guide as this is needed; for, except in the limited area of veterinary art, the causes of death among those creatures are either not noticed at all, or in too imperfect a manner to answer any useful purpose. As far as my own leisure permits, I intend to take every opportunity of examining the bodies of birds and animals, carefully booking the results.

The examinations I have thus far made, though comparatively few,

furnish hints for the management of living collections. I find that among birds, the diseases of which they die are seldom indicated with accuracy during life, and though often preventible, are also often incurable when once fully established. This shows that the mortality in collections is to be most certainly lessened by prevention. The medical treatment of sick birds is of little avail in the present state of our knowledge. But I also find that many deaths occur without much disease existing, merely from some temporary condition of the system; such, for instance, as suffocation, fainting, or inanition, from too long fasting, improper food, or eating too much at one time, from fright, over-exertion, cold, or exposure to the weather, from ill-ventilated houses, from resting in an unfavourable posture, from washing while in a weakly state, from accidental loss of blood, and from various other transient causes to be detected by observation, which suffice to kill a weakly bird; while the ailment from which the bird was suffering would not have sufficed to cause its death, but might, if the bird was cared for and sustained, have disappeared of itself. Thus are indicated the frequent administration of carefully selected food in small quantities at a time, the removal from water, except just what suffices to quench thirst, the confinement to a limited space, the quiet, warmth, shelter, and separation from other birds, the free access of air, and the absence of nooks and corners to mope in, which collectors well know to be essential to the safety of their sickly specimens. This resembles what is met with in medical practice, where every now and then the treatment has to be directed not against the disease, but against the tendency to death from trivial causes which it induces, from the weak state into which it throws the patient.

The observations now suggested, if continued and extended in the course of years, will, by-and-bye, indicate with accuracy the causes and symptoms of the maladies of birds and animals, and so lead to their prevention and cure. Nor is this all. A higher end will be obtained. Our knowledge of Natural History will be made more perfect, by learning to what diseases birds and animals are subject, and after what manner individuals and races die out. We shall also discover what diseases or causes of death are superinduced by a state of confinement, over and above those which are incident to the same creatures when living in their natural wild state. We shall then see how far such affections are analogous to those which occur in man, and by the light thus collaterally thrown upon them, the diseases of humanity, our knowledge of which is daily increasing, will be yet better understood; and thus, in the course of years, will be laid the

foundation of a more widely extended Comparative Pathology, and of a clearer knowledge of the phenomena of life and disease.

W. E. C. NOURSE.

8, Burwood Place, Hyde Park,
January 30, 1854.

Variety of Fishes exposed for Sale on the Continent.—Mr. Sclater's list of birds exposed for sale in the market at Rome, in January, 1853, recorded in your last number (Zool. 4160), brought to my mind the variety of fish I observed in the markets of Liege and Heidelberg, from the rivers Meuse and Neckar, during a tour through Belgium, France, and Germany, in August and September last. Our neighbours prize fresh-water fish much more highly than we do; and even the barbel, which is usually considered here as almost worthless, is held in much estimation by them. The fountains, in the fish-markets at Liege, have small tanks into which fresh water constantly flows, by which means the fish are kept alive for many days. In these tanks I observed barbel (*Cyprinus barbus*) in great numbers, from the weight of a few ounces to that of several pounds; chub (*C. cephalus*), some of a large size; roach (*C. rutilus*), dace (*C. leuciscus*), carp (*C. Carpio*), tench (*C. Tinca*), bream (*C. Brama*), gudgeon (*C. Gobio*), pike (*Esox Lucius*) of all sizes, and eels: salmon and trout seemed scarce, as I only observed them on one or two occasions. Another fish which was very abundant puzzled me not a little: at first I took it for the *C. dobula*, the *dobula* roach, figured in 'Yarrell's Fishes,' vol. i. p. 346, which is common in many of the German rivers; and it was not until my return home that I ascertained this fish to be the *Cyprinus Vimba*, figured in Bloch's 'German Fishes,' ed. 1787, vol. i., and called "Weiss fische," the name now given it in the market at Heidelberg, where it was quite as abundant as at Liege: this fish is of little worth for the table, being bony and insipid. I cannot find that it has ever been met with in any of our rivers; it is about the size of the roach, which in many respects it resembles, but it differs in the anal fin being larger, and the upper jaw extending over the lower, thereby making the mouth something like that of the barbel; if introduced into our rivers, which it readily might be, it would add much to the sport of the roach anglers. Travellers, when at Heidelberg, generally visit the Wolf's Brunnen, a pretty place, a short distance from the town, partly for the beauty of the scenery, and also to see the trout in the preserves there, some of which weigh four and five pounds a-piece, and are much esteemed for their fine flavour, and sell for half-a-crown a pound. They were fed while we were there, and it was interesting to see the avidity with which they seized a roach or dace, even before reaching the water. When served, as they frequently are, at the table d'hôte dinners, from their blue appearance, arising from the practice of boiling them in vinegar and water, some persons refuse to partake of them; but when the firm flesh and delicious flavour have once been experienced, they are seldom again guilty of the like enormity.—*R. Wakefield; Sussex Place.*

Note on the Lampern, or River Lamprey (*Petromyzon fluviatilis*).—Mr. Yarrell observes in his 'British Fishes,' vol. ii. p. 455, 1st. ed., that the spawning-season of this fish is May. About the middle of April of last year (1853), large colonies of its young were to be seen in the Burn of Blackton, parish of King Edward, Aberdeenshire;

some of which I obtained. They measured from five to six inches in length, and were of the thickness of a common writing-quill.—*George Harris; Gamrie, Banffshire, February, 1854.*

Note on the Anglesea Morris (Leptocephalus Morrisii).—During a storm which occurred in the Moray Firth about the middle of April last, no fewer than four specimens of this fish were cast ashore at Pennan, Aberdeenshire. One of these I secured, which was seven inches in length. A slight jag at the base of the tail on the upper surface, appeared to have the effect of making the tail point upwards, but it is possible that this may have been the result of an accident at a former stage in the creature's growth.—*Id.*

Note on the Twaite Shad (Alosa Sinta).—A very good example of this fish was caught in the Deveron, at Rack Mill, about a mile and a half from the sea, on the 2nd of September of last year.—*Id.*

Note on the Lesser Weever (Trachinus Vipera).—A very perfect specimen of this little fish was sent me from Pennan, in autumn last. In August, 1852, I received from one of the fishermen of Gardenston a very good example of the great weever.—*Id.*

Note on the Great Weever (Trachinus Draco).—This fish measured in length eleven inches. A specimen of one caught some years ago at Macduff, also in this parish, measured twelve inches, while that of the species last referred to, measured only about seven inches in length. Notwithstanding the opinion of my accomplished and esteemed friend the Rev. George Gordon, of Birnie (Zool. 3457), as well as that of other authorities, I cannot help being suspicious that there is something venomous in the larger dorsal spines of these animals, particularly in the case of the smaller one; but whether that may reside within the spine, or exist some way external to it, I do not hazard a conjecture. As the fishermen assert, there is certainly something *ugly* in the dingy dark of all the parts of the most advanced dorsal; and in addition, they all affirm that a wound from it is regularly followed by severe, and, in some cases, by even alarming symptoms. Such is stated to have happened in the case of the one found at Macduff, and I can bear testimony to similar effects in the cases of the other two here referred to, particularly in that of the lesser weever caught at Pennan. The man, upon whose line it was found, in taking it off the hook, was stung by it in the hand, and in less than half-an-hour the whole of the hand was considerably swollen: the swelling went on extending to the wrist, and the two middle fingers, being more in the line of the wound, were more swollen than the others. About an hour thereafter the hand had increased to twice its natural size, when, the doctor having been reached, free scarifications, with other proper means, proved effectual in arresting further morbid progress. The hand healed up perfectly within a reasonable period, and with very little of the character of a discharging sore. You will not therefore blame me in saying that I cannot help feeling, from the almost unvarying testimony of those who have had the best opportunities of seeing, as well as those who have experienced the effects of these wounds, together with what I myself have witnessed of them in this locality, that there is good reason for suspecting the existence of a peculiar *virus* or venom in the formidable thorny armour of this fish, its inflictions being followed by more rapid and higher inflammatory action than is seen to occur after a wound from a spicula of bone, or the spines of most other species of fish, and which appear to be too uniform to admit of explanation on the recognized grounds of diathesis or idiosyncrasy of constitution.—*Id.*

Note on the Crested Blenny (*Blennius palmicornis*).—Several specimens of this fish have occurred to the east of this district in the Moray Firth. Mr. Peach has also obtained it at Peterhead.—*Id.*

Note on the Poor or Power Cod (*Morrhua minuta*).—This is abundant with us, though by some oversight it has not, so far as I have noticed, been included as a denizen of our waters.—*Id.*

Occurrence of the Four-horned Cottus, (*Cottus quadricornis*, *Linn.*).—On the 7th of this month I had a fine specimen of this fish brought me which had been caught in a seine in the backwater here; it is not a very large piece of tidal water, and a river runs in at the top, so that there is a large proportion of fresh water. The fish was forwarded to the Zoological Society's aquarium.—*William Thompson; Weymouth, February 14, 1854.*

*List of Land and Fresh-water Mollusks found in the Neighbourhood of Ackworth, Yorkshire.** By CHARLES ASHFORD, Esq.

THE Nomenclature of the following List is that of Gray's Turton's 'Manual.'

Bithinia tentaculata. Abundant; invariably covered with an earthy incrustation.

Valvata piscinalis. Abundant at Winterset reservoir (five miles south-west), and common here.

Arion ater. Common; of several shades between black and russet brown.

Limax maximus. Common, but generally not so large; I have often seen them in other districts.

„ *carinatus*. Several specimens once found together on a stone wall, after a wet day.

„ *agrestis*. Superabundant.

Vitrina pellucida. Of frequent occurrence, especially in early spring, at the bottom of hedges, among wet leaves, &c.

Helix aspersa. Common and voracious, as everywhere else.

„ *hortensis*. Occasional.

„ *hybrida*. Rare; one good specimen found under a stone a few days ago, with *hortensis* and *nemoralis*.

„ *nemoralis*. Common; one specimen was found marked with rich mahogany-like blotches instead of bands.

* Ackworth is situate on the borders of the sandstone of the coal measures, with the magnesian limestone and new red sandstone within two or three miles.

Helix lapicida. Tolerably abundant among the fissures of the limestone rocks, at Went Vale.

„ *pulchella*. Pretty common; specimens of var. *imbricata* have been found in dry as well as marshy situations. (See Turton, p. 142).

„ *Cantiana*. Common, but local, being confined to a few hundred yards of hedging.

„ *fusca*. Not been found nearer than the woods by Doncaster, and can hardly be said to belong to this neighbourhood.

„ *fulva*. Tolerably common, at roots of grass in damp situations.

„ *aculeata*. Common among damp vegetable matter at hedge-bottoms.

„ *granulata*. Found in a small copse some years ago, but not lately.

„ *sericea*. Two or three specimens were found here last year by W. Robinson, of York.

„ *hispida*. Common, among loose stones, &c.

„ *concinna*. Abundant.

„ *depilata*? One or two supposed specimens.

„ *rufescens*. Common on a hedge-bank near Wakefield; I have all shades, from light horn to bright brown.

„ *virgata*. Abundant among the herbage near the Pontefract railway station, but comparatively small in size.

„ *caperata*. Not common.

„ *ericetorum*. Common at Went Vale, on limestone herbage.

Zonites rotundatus. Abundant, under stones.

„ *pygmæus*. Pretty common, at roots of damp and peaty grass.

„ *alliarius*. Occasional, beneath stones; strongly garlic-scented, especially when irritated.

„ *cellarius*. Common, in its usual haunts.

„ *purus*. Common, among decayed leaves, at hedge-bottoms, and in woods.

„ *crystallinus*. Ditto.

„ *nitidulus*. Very common, under stones, &c.

„ *radiatulus*. Occasionally found at roots of grass, in damp pastures.

„ *lucidus*. This beautiful shell occurs in unusual abundance among the stranded flags and Equiseta of Hemsworth Dam. The large specimens seem to be more or less corroded at the apex.

Zonites excavatus. Three specimens of this rare shell were unexpectedly obtained last year, from an old loose tree-stump, in the wood at Winterset.

Succinia putris. Occasional, but not by any means so abundant as *S. Pfeifferi*, which, though small, swarms in the same locality as *Zonites lucidus*.

Bulimus obscurus. Not common; perhaps overlooked from its power of concealment.

Zua lubrica. Common, at roots of grass, &c.

Achatina acicula. Several specimens of this shell from the limestone at Went Vale, but only two or three inhabited.

Pupa umbilicata. Common.

„ *marginata*. A few dead, but good specimens, from the moist earth of the same locality as *Achatina acicula*.

Vertigo. Some of these neat little shells have been obtained from the magnesian limestone crags at Went Vale, chiefly among the débris that has collected by the side of the rocks and become mixed with the vegetable mould and decayed leaves below. By filling a botanical case with this earth, and examining it at leisure, I have procured at one forage above one hundred and sixty specimens of *pusilla* (not many alive, but the shells in good condition), some thirty or more of *pygmæa*, and about fifty of *edentula*; besides two or three of *substriata* and *cylindrica*, with dozens of several commoner shells.

Vertigo palustris. A few score specimens from the wet grass, on the banks of Hemsworth Dam.

Clausilia nigricans. Common, in the woods among tree-moss, &c.

Carychium minimum. Common, at roots of mossy grass.

Limnæus auricularius. Not uncommon at Hemsworth and Winterset.

„ *pereger* and its variety *lineatus*. Common. The vars. *acutus* and *lacustris* not so common.

„ *palustris*. A few specimens from small field-pools.

„ *truncatulus*. Abundant in grassy ditches.

„ *glaber*. Abundant in one meadow-pool, confined to a few square yards. The peculiarity giving rise to var. *lineatus*, in *L. pereger*, I have observed in all the species of this genus.

„ *fluviatilis*. Not uncommon.

Velletia lacustris. Pretty common in one small pond, adhering to grass, &c.

Physa fontinalis. Abundant in the mill-pond.

Aplexus hypnorum. Not common.

Planorbis albus. Good specimens, from Hemsworth Dam.

„ *lævis*. Abundant, in one small depopulated fish-pond, adhering to *Potamogeton crispus*; some strange monstrosities.

„ *imbricatus*. Not common; found with *Velletia lacustris*.

„ *carinatus*. A few specimens.

„ *marginatus*. Common.

„ *vortex*. Common, in stagnant pools.

„ *spirorbis*. Ditto.

„ *nitidus*. This well-named species was common in an old fish-pond, among duckweed, a year or two ago, then nearly disappeared, but has since increased.

Cyclas cornea. Abundant, but small.

„ *lacustris*. Three specimens, obtained last year from a stagnant pool.

Pisidium nitidum. Common, in one small pool.

„ *Henslowianum*. Three specimens hitherto.

„ *amicum*. Pretty common, in running streams.

„ *cinereum*? This, and *pulchellum*, I am not satisfied about. We find here, abundantly in one locality, a species we can refer only to *cinereum*.

Anodon cygneus. Carted for manure last year, from Nostatt Dam. I cannot speak to the varieties; there appear to be puzzling connecting links among them.

Unio Pictorum. Considerable numbers in the Went, near and in Went Vale.

„ *tumidus*. In same locality, but not so common as the last.

Dreissena polymorpha. In the feeding canal from the Winterset reservoir, attached in masses to stones, as usual, but almost every specimen corroded by the water.

CHARLES ASHFORD.

Flounder's Institute, Ackworth, near Pontefract,
January 27, 1854.

Suggestions for the consideration of Collectors of British Shells.—Might it not add to the interest of collections to have well-executed figures of the animals of such genera (as *Arion*) as have no shells, or (as *Limax*) as have scarcely any, so prepared as to admit of being cut out of a plate and inserted in the cabinet? Perhaps the animal of one species of a genus, or at least of a higher group, might be engraved and coloured (in the best style) for such a purpose. It adds very much to the interest of collections to intercalate woodcuts, models, or other representations of animals, which

cannot well be exhibited, either from size, rarity, or (as among Mollusca) from the impossibility of preserving them otherwise than in fluids. A small subscription among shell-collectors would procure an engraving of such as it would be most desirable to have thus prepared, but they should be done in the very best style, or they would be worse than useless.—*J. S. Henslow; Hitcham, Suffolk, February 22, 1854.*

Occurrence of Doris bilamellata, &c. — I obtained a few specimens of this pretty Doris from eight or nine fathom water, amongst Cellipora cervicornis; also Doris tuberculata from the sides of the quay, at low-water-mark; and also one specimen of a Doris allied to *D. ripanda*.—*William Thompson; Weymouth, February 14, 1854.*

Occurrence of Lucernaria auricula. — I have lately taken a dozen or two of this pretty little zoophyte, being the first I have found in any numbers here.—*Id.*

NOTICES OF NEW BOOKS.

'The Annals and Magazine of Natural History.' No. 73, dated January; No. 74, dated February; and No. 75, dated March, 1854. London: Taylor & Francis, Red Lion Court, Fleet St. Price 2s. 6d. each.

The January number contains the following papers: —

'On the Structure of Echinoderms.' By Johannes Müller. Translated from the German by Thomas Huxley, F.R.S.

'On a new Species of Tanager in the British Museum.' By Philip Lutley Sclater, M.A.

'Descriptions of new or little-known Species of Reptiles collected in Ceylon.' By E. F. Kelaart, M.D., F.L.S., &c.

'Note on Spadix purpurea.' By Prof. Edward Forbes, F.R.S., &c.

'Descriptions and Illustrations of new Species of Verrucaria and Sagedia found about Torquay, Devonshire.' By Richard Deakin, M.D.

'Account of a M.S. of Laurence Theodore Gronov, lately purchased for the British Museum, with a Collection of Dry Fish which it describes.' By John Edward Gray. Ph.D., F.R.S., V.P.Z.S.

'A Catalogue of the Species of Ants found in Southern India.' By T. C. Jerdon, Esq., Assistant Surgeon, Madras Medical Establishment.

Bibliographical Notices: — *'The Palm Trees of the Amazon and their Uses.'* By A. R. Wallace. *'The Botanist's Word Book: an Etymological and Explanatory Vocabulary of the Terms employed in the Science of Botany.'* By G. Macdonald and J. Allan. *'A Narrative of Travels on the Amazon and Rio Negro, with an Account of the Native Tribes, and Observations on the Climate, Geology, and Natural History of the Amazon Valley.'* By A. R. Wallace.

Proceedings of Societies:—Zoological—Botanical Society of Edinburgh—Royal Society of Edinburgh.

Miscellaneous : — On the Anatomy of *Terebratula australis* ; by M. P. Gratiolet : translated from the 'Comptes Rendus' for July 11, 1853, p. 45. On the Teeth of *Peronia* and *Otina* ; by J. E. Gray, Ph.D., &c. Habits of Birds ; extracted from Wallace's Travels. On a Species of African Ant ; by Dr. L. Imhoff : extracted from the Bericht Verh. Nat. Ges. 1852, p. 175. On a new Muscle-element in the Thoracic Muscles of Insects ; by Dr. Burnett : extracted from Silliman's Journal for September, 1853. On *Desmarestia pinnatinervia*, Mont. ; by the Rev. M. J. Berkeley, M.A. On *Oligoneuria rhenana* ; by Dr. L. Imhoff : extracted from the Bericht Verh. Nat. Ges. 1852, p. 177.

The papers in No. 74 are thus intituled : —

'Monograph of the British Graphideæ.' By the Rev. W. A. Leighton, B.A., F.B.S.E.

'Characters of a new European Pupa, and of a new Australian *Bulimus*.' By W. H. Benson, Esq.

'A Catalogue of the Species of Ants found in Southern India.' By T. C. Jerdon, Esq., Assistant Surgeon Madras Medical Establishment.

'Note on the Greenland and Iceland Falcons.' By John Hancock, Esq.

'On the Structure of the Echinoderms.' By Johannes Müller.

'Notes on the Ornithology of Ceylon, collected during an Eight Years' Residence in the Island.' By Edgar Leopold Layard, F.Z.S., C.M.E.S.

'On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.' By Thomas Williams, M.D., Lond.

'Catalogue of Reptiles collected in Ceylon.' By E. F. Kelaart, M.D., F.L.S., &c.

Proceedings of Societies : — Zoological.

Miscellaneous : — Note on the Bird of Paradise, (*Paradisea Apo-dus*) ; by M. de Lafresnaye : extracted from the 'Revue et Magasin de Zoologie,' 1853, p. 339. New Observations on the Development of the Intestinal Worms ; by Prof. Van Beneden : extracted from the 'Comptes Rendus' for November 21, 1853, p. 788. Further Observations on the Animal Substance analogous to Vegetable Cellulose ; by M. Virchow : extracted from the 'Comptes Rendus' for December 5, 1853, p. 860.

We need only allude to one of these papers, that by Mr. Hancock. This ornithologist published an opinion that two very similar species of *Falco* were, by many naturalists, included under the name of *Falco Islandicus*; these are characterised as the Greenland falcon (*Falco Grænländicus*), and the Iceland falcon (*Falco Islandicus*): both of them are usually included by English ornithologists under the name of gyr falcon or jersfalcon. In 1838, Mr. Hancock entered fully into the question of plumage, as far as he was then able to decide on such differences as age, sex, season, and casual aberration might be supposed to produce. Whether his conclusions were drawn from true premises at that time, the following passage in the present paper will show:—

“When I drew up my paper, I considered all the white birds from Greenland to be mature, describing the nest-plumage from a dark specimen, which, having a white quill-feather coming, seemed to prove that it was the young of this species. There is now no doubt that this is wrong, and that this individual is really an immature Iceland falcon, the white quill-feather being abnormal.”—P. 110.

Nothing daunted by this error, thus honourably acknowledged, Mr. Hancock's general conclusions are the same now as in 1838; but he closes his paper with a paragraph that somewhat startles us:—

“In conclusion, it may be stated that the characters of the two forms are *permanent* and sharply defined, *never blending into each other*; and that the young, as well as the mature birds, can always be distinguished. But whether these two falcons are to be considered *distinct species or mere races*, must depend upon the views entertained regarding what is to constitute specific character.”—P. 112.

So that after all the pains which the author has taken; after he has imposed names and defined characters; after he has positively stated that the characters are *permanent* and *never blending*; and that individuals, young or old, may *always* be distinguished, we are told that the reception of the two as species, is to depend on our own option in settling what a species really is.

Birds of Paradise in confinement. — “A rich colonist at Batavia kept a number of rare birds in confinement, and amongst them several pairs of birds of Paradise. A captain who visited this colonist was much struck with the way in which the males displayed themselves before the females. By means of a sort of vibration of their entire plumage, they raised all the feathers, including their long plumes, and surrounded themselves completely, so as to form a sort of halo, in the centre of which the bright green head formed a disk, which at the

moment looked like a little emerald sun, with its rays formed by the feathers of the two plumes. He had no doubt that this action, which was frequently repeated, was intended to please the females, as is remarked in all birds the males of which are furnished with ornaments."—P. 157.

No. 75 contains the following papers : —

‘Contributions to the Palæontology of Gloucestershire : a Description, with Figures, of some new Species of Echinodermata from the Lias and Oolites.’ By Thomas Wright, M.D., &c.

‘Descriptions of some newly discovered Species of Araneidæ.’ By John Blackwall, F.L.S.

‘On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.’ By Thomas Williams, M.D. Lond.

‘Description of a new Genus and Species of Seal (*Heliophoca Atlantica*) from Madeira.’ By Dr. J. E. Gray, F.R.S., V.P.Z.S.

‘Monograph of the British Graphideæ.’ By the Rev. W. A. Leighton, B.A., F.B.S.E.

‘Notes on the Ornithology of Ceylon, collected during an Eight Years’ Residence in the Island.’ By Edgar Leopold Layard, F.Z.S., C.M.E.S.

Bibliographical Notice : — ‘Symbolæ ad Monographiam Marseniarum.’ Auctore Rudolph Bergh.

Proceedings of Societies : — Zoological—Botanical of Edinburgh.

Miscellaneous : — On *Sciurus glacialis* (*Læmargus borealis*, Müll. & Henle) and its Parasites ; by P. J. Van Beneden : extracted from the ‘Bulletin de l’Académie Royale de Belgique,’ 1853, No. 2, p. 258. On the Genus *Latia* ; by Dr. J. E. Gray, F.R.S., &c. The Anglesea Morris, (*Leptocephalus Morrisii*) ; by C. W. Peach. Figured Pearls of the Chinese ; by Dr. J. E. Gray, F.R.S. &c. On a Migration of Dragon-flies ; by M. C. Morren : extracted from the ‘Bulletin de l’Académie Royale de Belgique,’ 1853, No. 2, p. 323.

Mr. Layard’s paper on the birds of Ceylon is as interesting as ever, but far too long for the pages of a monthly Magazine : and the same observation applies with still greater force to several other papers, which are continued from month to month. We give an extract from Mr. Layard’s paper, to show how pleasantly he writes.

The Hooded Crow of Ceylon. — “The hooded crow (*Corvus splendens*) is essentially a ‘cit ;’ he is never found away from towns, and the denser the population the more frequent is he. He builds his

nest in the Hibiscus trees in the court-yard of the Government-house, or of the merchants' store ; and, while in these situations the windows of his white fellow-citizens often overlook his domestic arrangements ; he, in turn, from his eyrie on the top of the rocking palm, looks down upon the lowly huts of the black ones. He levies contributions on all alike : leave but your breakfast-table for a moment, and as you return, the rustle of hurrying wings, the marks of many feet on the white table-cloth, the gashes in the pat of butter, and the disappearance of plantains and small viands, proclaim who have been the robbers. The old 'hopper-woman' sits frying her cakes under the lowly 'pandal' of her cadjan hut, and over her, with head inclined, taking a bird's-eye view of her cookery, sits the 'caca ;' and now the '*appah*,' Anglicè 'hopper,' is done, lifted from the pan, and laid upon the little circular basket ready for a customer. With a grunt of satisfaction the aged crone surveys her handiwork, and drops her spoon to feel for her beloved betel-pouch ; a tiresome little bit of 'areca-nut' has got into a corner, and the old dame bends over it, unmindful of her charge, a dark figure drops from the roof, and though she is instantly on the alert, and aims an ineffectual blow at the thief, the nice white '*appah*' is borne off. Sometimes, however, the robber has but a poor hold on it and drops it on the red cabook road ; down pounce a host of crows that have been looking on from many a tree, and a scuffle ensues ; but anxious at least to cheat them of their booty, if not to retain the damaged article for her own eating, the old woman hurries to the rescue ; but this makes matters worse, the castle is defenceless, and unseen foes drop down from beam and rafter or fly in through open doors. The rice-basket is invaded, the chilli-box overturned, the dried fish stolen, and lucky is the dame if the crash of most of her little store of crockery and glass, swept to the ground and scattered in shining fragments, does not hastily recall her to her hut.

" But in spite of these annoying thefts, the amount of good done by the vast numbers of these birds which frequent our towns is very great : they are the great street-scavengers ; nothing escapes their quick eyes ; everything that can be eaten is devoured as soon as discovered, and early and late they are on the watch for whatever is thrown out : and so nimble are they, that I have frequently seen them catch small bits of carrion, or other matters, before they fell to the ground. They have not the least fear of the natives, and even European children are unheeded by them ; and I have seen my boy's hand bitten and bleeding from their attempting to snatch his bread from him. But of the white man and his gun they entertain the most

wholesome dread. Point but a stick at one and away it flies, while yet two or three hundred yards distant, and alarms the whole winged fraternity with his cries. Crows flock from all quarters, and, sailing high in air, caw in concert till the object of their dread has disappeared. However, should one unwary bird fall before the gun, his companions hasten to assist him, and will often raise him up, and fly so heedlessly round the head of the fowler, that a dozen perhaps may be shot before the remainder, conscious of their danger, seek safety in flight. Their nests are loose structures of sticks lined with hair, built in cocoa-nut or other trees, and the eggs are 1 inch 7 lines long by 1 inch 1 line broad. The general colour is a light bluish green, mottled more sparingly than those of the carrion crow with dark brown, the markings also being at the obtuse end; but in these particulars considerable variation occurs in both species, and I have some eggs in which the markings are almost obsolete."—P. 214.

'The Natural History Review.' January, 1854: 40 pages 8vo.
Price Six Shillings a-year. Dublin: Hodges and Smith. London: Simpkin, Marshall, & Co.

WE shall probably ere long have an opportunity of announcing more confidently than we can at present, those particulars concerning this new undertaking for which every Magazine and book buyer will at once ask. For instance:—How often will it appear? Has it a fixed periodicity, or an erratic course? What is the price of each number? Is this the first of a series? What is its object? Is it to be confined to reviews and reports of Societies, as in the present instance, or is to embrace the whole range of Natural History? As the book is kindly transmitted to us for review, we would gladly give all the information in our power respecting it; more especially as we cannot, with any propriety, review a review, or criticise the authorised reports of scientific Societies. The work, in fact, takes so nearly the same ground as the *'Zoologist,'* that it were scarcely seemly on our part to pen a single sentence that might even appear to blame, lest it be thought that we were suffering under a nervous apprehension of troublesome rivalry; whereas nothing can be more gratifying than the manner in which the *'Zoologist'* is spoken of in the new journal: if the publication of such a journal could occasion the slightest sore, the balm of its editorial approbation must effectually heal the wound.

'*Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.*' Parts VIII.—X. London: Van Voorst. December, 1853. Each Part contains 32 pages of letter-press; price 2s. 6d. Demy 8vo. plain, 5s. Royal 8vo. coloured.

PART VIII. comprises the following genera: — *Terebra*, *Adanson*; *Pusionella*, *Gray*; *Pyramidella*, *Lamarck*; *Obeliscus*, *Humphrey*; *Turbonilla*, *Risso*; *Odostomia*, *Fleming*; *Eulimella*, *Forbes*; *Aclis*, *Loven*; *Monoptygma*, *J. Lea*; *Eulima*, *Risso*; *Niso*, *Risso*; *Leiostraca*, *H. and A. Adams*; *Stylifer*, *Broderip*; *Cerithiopsis*, *Forbes & Hanley*; *Architectonica*, *Bolten*; *Torinia*, *Gray*; *Philippia*, *Gray*; *Omalaxis*, *Deshayes*; *Discohelix*, *Dunker*; *Conus*, *Linneus*; *Nubecula*, *Klein*; *Dendroconus*, *Swainson*; *Leptoconus*, *Swainson*; *Cylinder*, *Montfort*; *Hermes*, *Montfort*; and *Deraphus*, *Philippi*.

Part IX. comprises the following genera: — *Strombus*, *Linneus*; *Harpago*, *Klein*; *Gladus*, *Klein*; *Terebellum*, *Klein*; *Cypræa*, *Linneus*; *Aricia*, *Gray*; *Luponia*, *Gray*; *Cypræovula*, *Gray*; *Trivia*, *Gray*; *Amphiperas*, *Gronovius*; *Calpurnus*, *Montfort*; *Cyphoma*, *Bolten*; *Volva*, *Bolten*; *Simnia*, *Risso*; *Pedicularia*, *Swainson*; *Cancellaria*, *Lamarck*; *Admete*, *Kroyer*; *Trichotropis*, *Broderip & Sowerby*; *Aporrhais*, *Aldrovandus*; *Struthiolaria*, *Lamarck*; *Halia*, *Risso*; *Cerithium*, *Adanson*; *Vertagus*, *Klein*; *Colina*, *H. & A. Adams*; *Bittium*, *Leach*; *Triphoris*, *Deshayes*.

Part X. comprises the following genera: — *Lampania*, *Gray*; *Tympanotonus*, *Klein*; *Pyræus*, *Montfort*; *Telescopium*, *Chemnitz*; *Cerithidea*, *Swainson*; *Tiara*, *Bolten*; *Melanella*, *Swainson*; *Melanoides*, *Olivier*; *Ceriphasia*, *Swainson*; *Pachycheilus*, *Lea*; *Io*, *Lea*; *Melania*, *Lamarck*; *Hemisinus*, *Swainson*; *Vibex*, *Oken*; *Gyrotoma*, *Shuttleworth*; *Tricula*, *Benson*; *Leptoxis*, *Rafinesque*; *Pyrgula*, *Christie & Janson*; *Melanopsis*, *Ferussac*; *Faunus*, *Montfort*; *Clionella*, *Gray*; *Littorina*, *Ferussac*; *Tectarius*, *Valenciennes*; *Echinella*, *Swainson*; *Modulus*, *Gray*; *Risella*, *Gray*; *Lacuna*, *Turton*; *Fossar*, *Adanson*; *Isapis*, *H. & A. Adams*; *Lithoglyphus*, *Mullfeldt*.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

March 6, 1854.—E. NEWMAN, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for March; by the Editor. The 'Athenæum' for February; by the Editor. The 'Literary Gazette' for February; by the Editor. The 'Journal of the Royal Agricultural Society of England,' Vol. xiv. part 2; by the Society. 'Revue et Magasin de Zoologie,' 1853, No. 9; by the Editor, M. Guérin Méneville. 'Proceedings of the Royal Society,' Vol. vi., No. 101; by the Society. 'Synopsis des Caloptérygiènes,' par M. Edm. de Selys-Longchamps: Bruxelles, 1853; by the Author. 'Journal of the Society of Arts' for February; by the Society.

Election of Members.

Charles Melley, Esq., Liverpool, was elected a Member; and S. C. Tress Beale, Esq., Ivy Court, Tenterden, was elected a Subscriber.

The Society's Excursions.

It was announced that the Society would make two excursions this year, one on the 10th of June, to Pembury, near Tunbridge, the other on the 8th of July, to Mickleham. Tickets for dinner, on either occasion, may be obtained by Members, for themselves or friends, of the Officers of the Society, at 2s. 6d. each, up to the 2nd of May; and after that day, at 3s. 6d. each.

Exhibitions.

Mr. Stevens exhibited specimens of the new British *Zygæna Minos*, taken last June, near Galway, by Mr. Henry Milner. He also exhibited some Coleoptera and Lepidoptera, just received from Mr. Fortune, in the North of China, several being remarkable from their great similarity to British species; and he also exhibited some Lepidoptera, including some *Micros* collected by Herr Guenzius at Port Natal.

Mr. Stevens exhibited the fine specimen of *Morpho Cyperis*, presented to the Society by Mr. T. J. Stevens, which had become saturated with grease, and was now quite restored by means of camphire and magnesia.

Mr. Moore exhibited a mud nest of a mason bee or wasp, containing several cells, in one of which he found a *Chrysis*, in another a wasp, and in a third part of a spider, all of which had probably entered after the builder of the nest had left it. The nest was found on a wall at Dacca, in India.

Mr. Curtis exhibited the following larvæ, which he intends to describe for a future meeting:—Larva of a *Harpalus*? of *Stenolophus vaporariorum*? *Cistela* (*Prionychus*) *ater*, *Prostomis mandibularis*, *Helophorus*? (alive at the end of two years), *Pyralis* (taken feeding on insects in a cabinet).

Mr. Foxcroft exhibited living specimens of *Boletophagus crenatus*, and the larvæ, also larvæ of a species of *Tinea*, probably *pellionella*, which had fed upon, and formed their cases of, hartshorn shavings.

Varieties of Lepidoptera taken near Ipswich.

Mr. Curtis, referring to the curious varieties of two species of *Argynnis*, captured near Ipswich, which were exhibited at the last meeting, said that that locality seemed prolific in curious varieties, for he had seen several of various *Lepidoptera* taken there. Mr. Desvignes also made a similar statement.

Capture of Hemerobius dipterus.

The President announced the capture by Mr. Dale, at Langport, in Dorsetshire, of *Hemerobius dipterus*. This insect was previously known as German, but not as British, and adds still another to the interesting contributions made to British Entomology by this most indefatigable and successful collector. The species was first described from a German specimen, in Burmeister's '*Handbuch der Entomologie*,' vol. iii. p. 973; and a second time by Mr. Walker, in the '*Catalogue of Neuropterous Insects in the British Museum*,' part iii. p. 298.

Works on Zoology and Geology.

The President said that he had again been requested to state, that Sir William Jardine would be happy to receive any additions, from authors of works on Zoology and Geology, to the lists of their writings already sent in for publication by the Ray Society; the appearance of this bibliographical volume having been delayed by the untimely death of the lamented Mr. Strickland, to whom it had been entrusted.

Insects of Moreton Bay.

The President mentioned that he had received a communication from Mr. Rawnsley, offering to collect insects for the Society, or any of its Members, at Moreton Bay, in New South Wales.

Larva of Monodontomerus.

Read, a letter from G. Newport, Esq., F.R.S., &c., controverting at great length some of the statements of Mr. F. Smith respecting *Monodontomerus*, published in the '*Transactions*' of the Linnean and this Society, and claiming the prior discovery of the larva.

Mr. Smith briefly replied that he had nothing to retract, and was content to abide by his former statements.

Phosphorescence of the Larva of an Insect.

The following paper was read : —

"Observations on the Phosphorescence of the Larva of an Insect." By J. Reinhardt. Read before the Association of Naturalists at Copenhagen, at the meeting on the 18th of February, 1863.*

"In April, 1862, on arriving towards the conclusion of my stay at Lagoa Santa, the larva of an insect, an inch and a half long, and emitting a strong light of a very peculiar kind, was brought to me, having been caught in a house just as it was creeping out from under a piece of timber lying in a passage. It had been seen the even-

* Translated from the Danish by Dr. Wallich, F.R.S., V.P. Linn. Soc.

ing before, but had escaped before any one could muster up courage to lay hold of it. None of the inhabitants of the village to whom the animal was shown knew anything about it; though it cannot be of particularly rare occurrence in that part of Brazil, because I have heard, from an amateur of Zoology from Sabara, that he had met with it several times in that town.

"The peculiarity in its luminous property consists in its producing two distinct sorts of light; for while all the segments of the body, with the exception of the prothorax, are each furnished on the dorsal side with two shining points radiating a greenish light, like that which we see in our glow-worm and similar forms, the whole of the head, excepting the eyes, antennæ, and the parts of the mouth, glows like a live coal, with the most vivid intensity, strikingly contrasting with the greenish luminous dots of the rest of the body. It is not, however, by the colour alone, and the locality of the light, that the animal becomes remarkable, and, so far as I know, unique among insects; but it appears moreover to be permanent: for, although it alternately diminishes in intensity, being at times scarcely observable by lamp-light, it is at other times quite distinct, nay, occasionally visible at mid-day; yet, during the whole of the twenty-four hours in which the insect continued alive with me, it never once lost its luminosity, and the decided alternations in the intensity were but little appreciable in the dark. Again, the greenish light of the segments contrasts with that which issues from the head, by fading and becoming perfectly imperceptible, and then again reviving, as is seen in the *Lampyris*; it frequently vanishes and becomes extinct in some of the segments, while in others it continues bright. It is rarely that the light is extinguished in all the segments simultaneously, and, on the whole, it is more nearly continuous than in the kind of insects just mentioned. The radiation takes place from the dorsal parts of the rings, behind and above the spiracles, without having apparently any absolute connexion with them, for it is seen also in segments wanting the spiracles, that is, in the mesothorax and last abdominal ring. The lucid points are of the size of the head of a small pin, and the light is so intense that it shines through the sides of the abdomen: when it ceases, no particular appearance is observable at the place whence it issued; and, unlike the luminous spots on the thorax of the shining *Elaters*, it is neither sharply defined, nor, in general, remarkable by any peculiar appearance; and on the larva being put into brandy, the red light was extinguished first, and then the green.

"I have in vain searched for any notice of such a larva in entomological works; neither is it mentioned in Ehrenberg's known memoir on the luminosity of the sea, prepared, no doubt, from the most extensive information upon all known phenomena of phosphorescence. I may therefore assume that the peculiar light in question has not hitherto been known to zoologists; although a short notice, giving the main features of the phenomenon quite correctly, but unaccompanied by any adequate account of the luminous animal itself, from the pen of F. Azara, appears in his '*Voyage dans l'Amérique Méridionale*' (t. i. p. 114), wherein the author reports that at Paraguay he saw 'a worm of nearly two inches in length, the head of which glowed at night like a piece of burning coal, and having besides along the body, on each side, a row of holes resembling eyes, from which a fainter yellowish light emanated.' This accords, in all essential points, so entirely with what I observed myself, that I must consider the little discrepancy of the holes themselves being luminous, as depending simply on a less attentive examination; and I am therefore of opinion that there can scarcely be a

doubt of the Paraguay worm being identical with, or at all events nearly allied to, that which I obtained at Minas.

"There cannot be a doubt of this larva being that of some Coleopterous insect, but of which it is impossible for me to say. It seems probable that the strong phosphorescence does not entirely cease with that stage, even although it should become more or less modified afterwards; and it may therefore be hoped that the property may lead to the discovery of the perfect insect. But although I have been collecting the Fauna of that part of the Brazils inhabited by this larva, through all seasons and on a somewhat large scale, yet have I never met there with any other luminous insects than Elateridæ and Lampyridæ. To the larvæ of the first of these families it has no resemblance; but it undoubtedly has several features in common with the latter, and on the whole it has a stronger affinity with these than with any other form of larva with which I am acquainted; and yet, as will be seen from the subjoined description, it differs from the larvæ of the three principal genera of the family in some essential points: so that it still remains a question whether the perfect insect will be found to belong to the Lampyridæ.

"*Description.*—My specimen was a little smaller than Azara's, and measured 40 millim. in length, and about 5 millim. in breadth. Body flattened in such a way that the dorsal side is slightly arched, and separated by a margin from the more flat abdominal side. Hairs are scattered all over the body, but more sparingly on the upper than on the under side, and especially towards the edge, where they stand so close together as to give that part a villous appearance. The colour above is a dirty reddish brown, below yellowish white. The head is horny, protruding somewhat horizontally, without admitting of being retracted and hidden by the first thoracic segment: there is a sharp fold around it, which gives the anterior part an appearance of extending from the hinder portion as from a sheath, and conceals the articulation of the lower parts of the mouth: on each side is one eye only, though rather large, placed inconsiderably before the fold just mentioned, and directed laterally and somewhat forward: before it are the palpi, which consist of four joints, the outermost being very short, and much thinner than the preceding ones. The structure of the mouth seems to indicate that the larva is of predaceous habits, which agrees also with the nocturnal life it appears to lead. The much-curved jaws are thick at their base, becoming rapidly attenuated towards their tips, without being terminated by a fine point; on their inner margin they bear only a small knob or obtuse tooth, and, when closed, they cross each other at the apex. There is an upper lip between the jaws, hardly large enough to fill the entire space between them, and therefore easily overlooked; its outer margin has a slight incision in the middle. The lower parts of the mouth, the jaws, and the under lip, are grown together with the extraordinarily developed basal joint, into a large plate, on which two deep furrows alone point out the limits of the lip and jaws: from the anterior margin of this plate, quite towards the sides, originate the maxillary palpi, which are cylindrical, short in comparison with their considerable thickness, and consist of four joints, the outermost being terminated by a slightly arched, cutaneous, and soft lamina, strongly contrasting with the other (brown) part by its whitish colour: close within these is the two-jointed maxillary lobe, almost concealed by the palpi, which are many times larger; and in the middle is seen what I think is properly the tongue, which is narrowest at its origin, widening towards the insertion of the two-jointed lingual palpi, and protruding between these with a little triangular elongation, bearing two brushes at its apex. There are twelve joints in the body, besides the horny

anus, which protrudes like a thirteenth joint: they are hard and horny, except on the under side of the pectoral portion, and especially the metathorax, where the joints are partially soft and skin-like. The first thoracic segment is larger than the other two, and on its abdominal side is marked with a deep incision, like a V, in which almost the entire under side of the head is uncovered and visible, while, on its back, the head has its posterior part covered by the prothorax. The legs are long and strongly developed, whence the motions of the animal are proportionably rapid. The coxa tends obliquely inward and backward, and lies close to the body; it is cylindrical in form, rather long, and movably connected with the femur, which, although stouter, is not longer than the tibia: the foot consists of a single, long, very pointed, but slightly curved claw. Of the segments of the body, the first four are of nearly equal length, but are perceptibly shorter than the last five, and these again differ slightly amongst themselves: the abdominal portion of the first eight segments is divided into five parts by means of four furrows, of which parts the middle one is broadest, the two on each side narrower; or it may be thus stated:—The ventral portion of the body is covered, not as on the back, by one, but by five horny shields. The spiracles are nine in number on each side; the foremost on the under side of the mesothorax, close to the anterior margin of this segment; the remaining eight on the eight first segments of the abdomen, where they are situated on the dorsal shield, directly below the edge, where it bends towards the ventral side."

Bombyx Cynthia.

Mr. Spence communicated the following extract from the 'Journal of the Society of Arts,' February 24, 1854:—

"Col. Sir William Reid, Governor of Malta, has forwarded to the Society of Arts, through the Colonial Office, a communication in which he states, that after many failures, through the very laudable and persevering efforts of Mr. Piddington, of Calcutta, with the aid of the Directors of the Peninsular and Oriental Steam Packet Company, he has received some sound eggs of the Indian silk-worm (*Bombyx Cynthia*), called by the natives of Assam 'Eria,' and which feed on the leaves of the castor-oil plant. Of the eggs received about five hundred have hatched, and the worms, after undergoing two mutations, still appear to be in a very healthy state, feeding only on the castor-oil plant. Mr. Piddington had, for some time previously to Sir William Reid's arrival in Malta, been striving to convey this silk-worm to the Agricultural Society of Turin, as they wish to introduce it into Italy; it will be his first duty, if he succeeds, to send it there."

Sir William Reid has also inclosed some copies of an account of the Assam silk-worm, which have been published in the 'Journal of the Society of Arts' of March 3rd. The following are extracts:—

"It is stated by Dr. Helfer that 'the Eria is reared over a large part of Hindostan, but more extensively in the districts of Dinagpur and Bangpur, in houses, in a domesticated state, and feeds chiefly on the leaves of *Ricinus communis*. The silk of this species has never been wound off, but people are obliged to spin it like cotton. It gives a cloth of seemingly loose coarse texture, but of incredible durability, the life of one person being seldom sufficient to wear out a garment made of it, so that the same

piece descends from mother to daughter. It is so productive as to give sometimes twelve broods of spun silk in the course of a year. The worm grows rapidly, and offers no difficulty whatever for an extensive speculation.

“On account of the double profit that would be derived from the same area of land by cultivating it with the castor-oil plant, which produces oil and feeds the worm, an extensive cultivation of this species would be highly recommendable; and if, also, the cloth is of the coarsest nature, it is, on the other hand, very valuable on account of its durability. May it not be particularly well adapted to mix in certain textures with cotton?”

“Dr. Helfer estimates that there are not less than a hundred and fifty species of moths in India [the larvæ of] which form cocoons more or less adapted for use in manufactures. He adds,—‘Many have made the objection that the silk of the Indian species is much inferior. This is yet an undecided question. The mulberry silkworm degenerates if not properly attended to. What has been done to raise the indigenous species from the state of their natural inferiority? Very much depends upon the cultivation of the worms in houses; secondly, on the method of feeding them, selecting not that vegetable substance which best gratifies their taste, but that which contributes to form a fine cocoon; and, thirdly, from the first chemical operations employed before the working of the rough material. But even if the raw material would not be capable of a higher degree of cultivation, the demand for it would, notwithstanding, never cease in Europe. All the silk produced in Hindostan has hitherto found a ready and profitable market in Calcutta, and the demand is always greater than the supply.’”
—J. W. D.

ZOOLOGICAL SOCIETY OF LONDON.

Secretary's Report, February 28, 1854.

THE number of visitors to the Gardens, not being Fellows of the Society, has exceeded all precedent, with the exception of the year of the Great Exhibition. But it is a remarkably interesting fact, that no single day even in that memorable summer approached the spectacle which was witnessed on Whit Monday last, when upwards of 22,000 persons paid for admission to the Society's collection. Although this vast multitude necessarily embraced many grades of the population, it is a most gratifying fact, which deserves to be recorded, that not a single instance of misconduct in any shape occurred during the whole day: but, on the contrary, the general character of the assemblage was that of earnest and intelligent enjoyment.

It must be regarded as a subject of the highest congratulation to the Society, that their establishment has fixed itself in this practically

useful manner upon the public mind; and the effect thus produced by it ought to stimulate to still further successes.

Aquatic Vivaria.

The principal new work of the year has been the arrangement of living fish, Mollusca, zoophytes, and other aquatic animals, first projected in 1851, which has probably excited more attention from its novelty and the intrinsic beauty of the objects themselves, than any other of the recent additions to the collection.

Although the series of tanks is limited to a length of 84 feet by the present extent of the building in which they are placed, an immense number of species have been exhibited in them, and it is a satisfactory proof of the control under which the method of management has been reduced, that there are at this moment several of the fish and zoophytes in the tanks which were placed there in May last; and, in the case of the fish more particularly, several others which formed part of the number experimented on in 1852.

The fish have spawned, and the zoophytes have produced their young in considerable abundance.

Algæ are growing luxuriantly in those tanks which are not agitated by the vivacious evolutions of the sea-fish, and this secondary feature is well worth the attention of botanists, to whom the opportunities thus afforded of studying the development of these plants are of the most complete character; while the extremely beautiful effect of colour, dependent partly on the Algæ themselves, and partly on the peculiar action of transmitted light, are not less instructive to the artist.

The present arrangement of the house consists of six tanks of fresh-water animals, chiefly fish, on the western side; and seven of marine animals on the eastern side; exclusive of several movable tanks of smaller size, which are placed as occasion requires in various parts of the central area.

The zoophytes which are most attractive in appearance are the Actinias or Sea-Anemones. The finest examples of them are to be found in tanks 9, 10, and 11, in which every age of these curious animals is well illustrated.

A good illustration of that most singular fact in the physiology of zoophytes, the alternation of generations, is at present afforded here by the appearance of the detached young of *Campanularia* which appeared for the first time on the 9th of February.

The Crustaceans have been represented throughout the year by several of the smaller British species, among which the young of the hermit crab have also recently appeared in considerable numbers.

None of the Mollusca which have been obtained are more interesting or have lived more successfully than the species which belong to the Nudibranchiate genera, *Æolis* and *Doris*.

Ribands of spawn have been deposited by the last-named, and as the water in which they live is never disturbed, there is very little doubt that the whole existence of these animals will be here subjected to observation. The elaborate monograph of Messrs. Alder and Hancock, published by the Ray Society, facilitates the study of this group in the most delightful manner, and places a complete knowledge of it within the reach of every one who chooses to consult their work.

The curious group of Ascidian Polypes (which take an intermediate station between zoophytes and Mollusca) have been copiously illustrated, frequent specimens of Botryllidæ, or compound Ascidians, of Ascidiadæ, or simple Ascidians, having been received, although from their sluggish leathery appearance they may not have attracted so much attention as their peculiar organization deserves.

Giant Anteater.

Among the Mammalia, nothing can be more interesting than the giant anteaters (*Myrmecophaga jubata*), of which the first adult specimen was obtained in September last. The nearest existing analogue to the Great South American Edentata of the Palæozoic periods, the most singularly organized animal of the whole group to which it belongs,—the anteater of Brazil, had long been one of the most important desiderata to the collection. With the exception of two very young specimens received by the late Earl of Derby, the anteaters now in possession of the Society are the first which have reached England alive; and as, from the period of the year, it has been impossible for many of the Fellows to have had an opportunity of visiting the Gardens since their arrival, there is no doubt that a great share of attention will now be given to these animals.

All the experiments which were tried, in the first instance, to find an artificial substitute for the Termites having failed, it became very doubtful whether so singular a rarity could be preserved during the winter. The treatment which Azara mentions as having been practised with the animals formerly sent to Madrid, has at last proved so

far successful as to make it probable that the anteaters will survive in their present quarters.

It may be useful to mention here that they retain much of the nocturnal habit of the species, and are, consequently, more often seen to advantage towards the close of the afternoon than at any other period of the day.

Lions.

The latest arrival at the Gardens, which deserves especial mention, consists of a pair of Asiatic lions (*Felis goojeratensis*, Smee), captured by the Nawab of Janaghar, and obtained from him by Sir Thomas Erskine Perry, formerly Chief Justice of Bombay, who brought them down to Bombay at his own cost, and then most liberally presented them to the Society.

Sir Henry Leake having, with generous anxiety to assist in the furtherance of Sir Erskine Perry's design, transmitted them to Suez, they were conveyed through Egypt under very favourable arrangements with the Directors of the Peninsular and Oriental Steam Navigation Company, whose extreme care the Society has had to acknowledge on many previous occasions.

The Asiatic lion affords many important considerations to the naturalist, for which I may refer to Captain Smee's paper upon this animal in the first volume of the Society's 'Transactions.'

The gradually approaching extinction of this noble animal in Northern India had, therefore, rendered it extremely desirable that an opportunity should be afforded us of studying the differences reported to exist between it and its African congener, when Sir Erskine Perry applied his influence to obtain living specimens for that purpose. The difficulties which have presented themselves in the enterprise which has now been so successfully concluded, render it very improbable that any subsequent attempts will be made in the same direction: and it is not too much to assert that Sir Erskine Perry has thus put the Society in possession of another of those characteristic rarities which are likely to remain unique in our collection.

These lions are attended by an aged native soldier, who has had charge of them from their capture, and exerts very extraordinary controul over their temper.

Three lion cubs have been born in the Menagerie in the course of the winter, and will be exhibited as soon as suitable accommodation can be prepared for them.

Antilopes.

In the general collection no greater progress has been made than with the antilopes, among which the most conspicuous fact is the probable acclimatization of the eland (*Boselaphus oreus*). It will be remembered that, by the bequest of the late Earl of Derby, the Society became possessed of two males and three females of this noble species at the close of the year 1851. Of these one female was adult, having been bred by his lordship at Knowsley in 1844; the others were scarcely a year old, having been then recently imported as fawns.

The three females have this year produced a male and two female fawns, all fine and perfectly developed animals, thriving as well as calves of the most highly bred cattle would do at the same age. If equally successful in the current year, the original herd will have doubled itself before the expiration of the next twelve months.

As the amount of protection which the eland requires in this country is scarcely more than is ordinarily given to the most valuable agricultural stock, there appears to be no difficulty whatever, if the subject is taken up by proprietors who have the requisite facilities, in the way of introducing a new and a most valuable venison into our parks. The magnificent character of this species, and the weight which it attains, is beginning to manifest itself in the oldest bull, who is, however, far short of maturity. A few minutes given to this extraordinary animal, which has been removed to the Wapiti-house (No. 58 in the plan), will satisfy any one of its beauty, power, and activity; while we have the concurrent testimony of every sportsman in Southern Africa as to the excellent quality of the meat as an article of food.

Of the other antilopes, the *Leucoryx* breeds freely, a third fawn having been recently produced by the female purchased at Knowsley.

The Society have, in addition, recently completed pairs of the Singing and the Bubale antelope (*A. Bubalis*), each representing an important group in this graceful and interesting family. Through the exertions of the Hon. C. A. Murray and Mr. Grace, Her Britannic Majesty's Vice-Consul at Mogador, a male and two females of the Aoudad (*Ovis tragelaphus*), have been added to the collection, and there is therefore every prospect of continuing them, as well as the Egyptian Ibex (*Capra nubiana*), of which one kid has been already born.

Deer.

Among the deer there would be no difficulty in obtaining still greater success, if the Society possessed sufficient acreage to develop this section of the Vivarium.

The rein-deer presented by Mr. Domville and Sir Henry Hunloke in 1850, have not only lived in good condition to the present time, but have produced a pair of fawns which are equally thriving.

The female Wapiti, bred at Knowsley in 1842, has this year produced her fourth fawn, and as the Society retains two of them, it is now to be hoped that this commanding species, of which no other specimens exist in Europe, will increase with rapidity.

The Javan Rusa deer have also bred, and there is equal probability that the herd of this species will be further extended.

It is worth the attention of those Fellows of the Society who possess deer-parks, that, with ordinary attention, the following species in addition to the preceding, will breed and flourish in any favourable situation in the South of England, and perhaps in any part of the country: — Barasingha (*Cervus Duvaucellii*), India; Axis (*C. axis*), India; Hog deer (*C. porcinus*), India; Sambur (*C. hippelaphus*), India; Sambur (*C. unicolor*), Ceylon; Virginian deer (*C. virginianus*), America; Texan deer (*C. — ?*), America; Long-tailed deer (*C. Lewisii*), America.

In fact, out of thirty-eight known species of deer, it is more than probable that twelve or fourteen might be placed in our parks without difficulty. The objection which has been raised as to the disagreement of the different species is necessarily theoretic; and we may presume that it is, at least, not likely to be a serious obstacle, when we see the perfect accord in which fallow deer and red deer are associated in Richmond and Windsor Parks, as well as in many other instances.

Llamas.

Considerable interest having of late years been attached to the genus Auchenia, the Council have collected a fine series of the animals of which it consists: of these the llama, alpaca, and guanaco have bred freely, and had there been sufficient accommodation for them, three very beautiful herds might have been formed from the present stock.

It may be remarked here that pure guanacos are seldom met with

in collections; and those bred by the Society are probably the first which have been produced in Europe. It is gratifying to think that, as they have been purchased by Lord Hastings, there is every chance of their being successfully continued at Melton Constable.

Miscellaneous.

The house formerly occupied by parrots (No. 27 in the plan) has been adapted for a class of animals for which there has hitherto been no adequate provision.

The various habits and organization of the smaller forms of *Mammalia* render it excessively desirable that more attention should be paid to them, and the present arrangement is therefore to be taken rather as a specimen of what may be done in that way, than as anything approaching a final arrangement. The advantage of the present system is well exemplified, however, by the *Genets* and the *Nandinias*, presented by Captain Sotheby, R.N. Next to these should be noticed *Bassaris astuta*, a rare and very interesting form from Mexico.

The *Tayra* is another American form, whose marten-like agility renders it always conspicuous. The Cape Hyrax, the congener of the animal which is designated as the "coney" in Scripture, finds a place in the same range of cages. On the opposite side will be found an extremely interesting series of *Caracals*; a pale and very beautiful male from India, paired with a deep red female from the Gambia; and a large grayish male from Nubia. The other cages are, for the present, occupied by *Ocelots*—a section of *Felidæ* which has not yet been thoroughly discriminated.

The monkey-house has been subjected to a course of cleansing and alteration which, in addition to increasing the accommodation, has rendered it infinitely more agreeable to visitors.

Among other additions to the collection, which the Council have in prospect, the arrival of a female *Hippopotamus* is to be expected in the beginning of summer, His Highness the Viceroy of Egypt having signified his intention of presenting to the Society an animal which, in accordance with his promise to the Hon. C. A. Murray, he has already caused to be brought into Lower Egypt for that purpose.

D. W. MITCHELL, B.A.,
Secretary.

Occurrence of Limax Gagates near Torquay and at Killarney.—Soon after the notice of the occurrence of this slug in the neighbourhood of Tenby was sent (Zool. 4048), I received by post two more small specimens from my brother, Mr. John P. Norman, of the Inner Temple, which had been taken by him in a lane beyond Mr. Bartlett's farm, near Torquay. He also informs me that he found another specimen in the garden of the Lake Hotel, Killarney, last autumn. I believe this is a new Irish locality for it. The peculiarly contracted form of the posterior portion of this slug when at rest, as mentioned in my former notice, is well represented in Captain Brown's 'Illustrations of Land and Fresh-water Conchology,' pl. 25, f. 17, but the anterior part is not drawn so much contracted as I have noticed it. — *Alfred Merle Norman; Clevedon, February 15, 1864.*

Larva of a Tortrix? feeding on Poppy Seeds.—I wish to record the habits of a small larva which I have recently discovered; and which, on careful examination, appears to belong to the Tortricidæ, though I have not ascertained the genus. Having had occasion to use some capsules of the *Papaver somniferum*, which had been put away in a bag, I was astonished on opening some of them to find they had formed a nidus for these larvæ, which appear to be nearly full-grown. The body is of a dull white colour, with a few straggling hairs; head reddish brown, with a lighter band at the posterior portion; ventral feet lighter in colour than the body. These larvæ form cocoons of silk, covered on the exterior with seeds interwoven closely, with only one apparent orifice. These cases are not portable, but exchanged for fresh ones, as the larva increases in size, if I may judge from the number of empty cases. I should mention that only the seeds are devoured, the shell of the capsule being left untouched.—*J. R. S. Clifford; 21, Queen's Row, Pimlico, March 11, 1854.*

Note on Uloma cornuta.—I had some hundreds of *Uloma cornuta*, *Fab.*, sent me from Sunderland, where they had been found in a bakehouse, breeding freely amongst the partly dried dough of the baking-board. I kept them alive in a wide-mouthed bottle for some months, but they did not seem to like their quarters, and died by degrees, most likely from the paste becoming too dry. The most singular part of the matter was that the whole were females. A short time ago a Newcastle grocer brought me several specimens of the same species, which he found in a cask of tapioca. They consisted of males and females, in nearly equal proportions.—*Thomas John Bold; Angas Court, Bigg Market, Newcastle-upon-Tyne, February 7, 1854.*

Note on Ophioscoma neglecta.—I may further take the present opportunity of supplying this omission in my late enumeration of the Ophiuridæ of this part of the coast. It seems to be more uniform in its characters than most of the others, and quite corresponds with the account given by Professor Edward Forbes, in his beautiful and valuable publication on the Echinodermata.—*George Harris; Gamrie, Banffshire, February, 1854.*

On the manner in which Parent Birds occasionally remove their Eggs and Young. By the Rev. ALFRED CHARLES SMITH, M.A.

IN reading over the works of our principal ornithologists we can scarcely help observing that there are certain "mysteries" in the science, which for a long time seemed to baffle all the investigation, and to elude the research of the most indefatigable. Very prominent among these mysteries stood the subject of this paper; "the manner in which parent birds occasionally remove their eggs and young." It was observed by many that birds *did* remove their eggs from one place to another from a variety of causes; and that they safely conveyed their young from a place of danger to one of security, when the chick was physically incapable of performing the journey on its own account: but *how* these removals were effected was a point which for a long time remained involved in obscurity: time, however, and accident, and careful observation on the part of naturalists have solved many of these mysteries, and I propose in the present paper to bring together such observations on the subject as I have been able to collect, and to discuss the whole question.

First, with regard to removing *eggs*. The shape, size, smoothness and brittleness of a bird's egg all seem to conspire to render it a very difficult burden for its owner to carry: nay, not only to its owner, but to a variety of other creatures which make it their prey, and which have in consequence resorted to a great many ingenious expedients to enable them to bear off the treasure which they have appropriated to themselves, without the risk of loss from fracture. Thus, Mr. Wolley tells us that a stoat will carry off a full-sized hen's egg between its chin and breast, holding it in this manner quite securely, while the paws are unencumbered and enabled to beat a retreat. Mr. Bury assures us that the rat will grasp a hen's egg with all four paws, and then turning on its back, suffer itself to be thus with its prize dragged away by the tail by its fellows to a place of security, convenient for dining: and however incredible this may seem, we all know that rats frequently *do* remove hens' eggs in a most mysterious manner to a considerable distance: and Mr. St. John adds that they even remove turkeys' eggs without breaking, or leaving any marks on the shell, and these often as large as their own bodies: Mr. Waterton recounts how crows and magpies adopt the easier method of pouncing on the pheasant's egg, and thrusting their beaks through the shell, bear it away on the point: and Rusticus says, the gulls are for ever

watching for an unguarded egg of the guillemot, and when they have found one, charge at it, using their beak as a lance, and, bearing it away on the tip, suck out all the goodness as they go.* The same amusing writer says that the raven carries off eggs, but in a different manner, seizing them in all probability with the feet.

All these are the devices of thieves, whereby they seek to appropriate to themselves the lawful property of others, and very various and in many cases very ingenious they are, but the legitimate owner of the egg, when she wishes to remove her treasure, can adopt none of these methods: if she attempted any of them, she would certainly break the shell and at once destroy her hopes of progeny. Yet occasionally she finds cause to apprehend danger, and devises means to remove her eggs safely. Stanley affirms that pheasants and skylarks will often, when alarmed, carry off their eggs and form a new nest. Hewitson relates how the dunlin contrived to carry off her eggs before his return to the nest, which he had discovered but a short time previously. Selby gives an account of some moorhens removing the eggs from their nest on the sudden rising of the water on whose margin they had built it, heightening the fabric with all possible despatch by adding fresh material, and then replacing the eggs in the nest now raised above danger. Yarrell describes how some partridges, perceiving the imminent danger and almost certain destruction to their eggs from the advancing plough, contrived to remove them in about twenty minutes to a distance of forty yards: and again, quoting from Audubon, how the spotted sandpiper filched away her eggs from the supposed place of security in which the finder had laid them.

These are all well-authenticated instances of eggs being removed to a place of greater security by the parent birds, but hitherto we have seen no solution to the question *how* that removal was effected. I proceed to prove that it is done by means of the beak, of which I myself was on one occasion an eyewitness. It was many years ago, when I was an Eton boy at home for the Easter holidays, and in the month of March, when the hedges were yet almost bare of leaves, that to my great joy I discovered in a thorn-hedge the first nest that I had seen that year, a hedge accenter's, containing four blue eggs, and the bird sitting thereon. Either not wishing to take it, or more probably hoping by patience to secure a larger prize, I contented myself with a long look at the treasure and withdrew, but still again and again the recollection of my discovery attracted me to the spot, where I

* 'Letters of Rusticus.'

have little doubt that I each time disturbed the parent bird. I have since learned, that most birds, tired with such persecution, would have forsaken the nest; but not so the affectionate hedge accentor: alarmed at my frequent interruptions and prying eyes, she took another course, and set about a new nest: she must have prepared it with marvellous rapidity, for on visiting my treasure after some two or three hours' respite on the day of its first discovery, I found to my surprise that it contained but three eggs: this astonished me a good deal, but I concluded that I had made a mistake in the first instance, and that there had never been more than that number. While pondering upon this, and just preparing to withdraw, I saw the hedge accentor return, and hurrying into the nest before my eyes, seize an egg in its bill between the upper and lower mandible, and fly away without the smallest apparent inconvenience. I had no idea of this being an unusual occurrence, I only knew it was more than schoolboy could bear, to stand by and see the eggs which he had found and considered his lawful prize, thus ravished from his sight: so, without more ado, and fearing a still further diminution of my already much lessened prize, I seized the nest containing the two remaining eggs, and bore them away. I was but a boy, some eleven or twelve years old at the time, but I recollect the above circumstance as vividly as if it happened but yesterday, and I have no doubt about the accuracy of my memory regarding it.

Now if the hedge accentor can grasp its egg in its beak, and fly off with it with ease, is it too much to infer that the pheasant, the skylark, the dunlin, the moorhen, the partridge, and the spotted sandpiper removed their respective eggs by the same means? I grant that the eggs of all these birds are of considerable size, in proportion to their bodies, and especially those of the last named; and as from the account given by Audubon, it does not seem that in this instance the eggs were removed to any great distance, perhaps in this case they were rather pushed than carried: but with regard to the other birds named, and to the many similar instances continually occurring, I have little doubt that the beak is the instrument used in the removal. That the mandibles even of the short-beaked birds will open to a great width is manifest to any one who goes near a nest of young birds in the spring: see to what extent the young blackbird will stretch open its mouth! what a gape is displayed by the young linnet asking for food! and as a proof that the same faculty is not wanting in the parent bird, a very interesting account is recorded by Mr. Bury in the 'Zoologist' (Zool. 932) of a moorhen seizing a moderate

sized apple in her bill, and running off with it among the sedge, which feat seems to have astonished the writer not a little. Another correspondent of the same periodical relates how a sitting duck took from her nest an egg (which proved to be addled) in her bill, and carried it a short distance; of which proceeding the writer was an eye-witness, (Zool. 2456).

I have abstained as yet from saying one word about the cuckoo; but if we can establish as a fact that the hedge accentor, the pheasant, the skylark, the dunlin, the moorhen, the partridge and others, can, when occasion requires, fly off with their respective eggs in their mouths, I apprehend we shall have little difficulty in concluding that the cuckoo is quite *able* to carry in its bill its own egg, which is so very small in proportion to the size of the parent bird. If then the cuckoo is well *able* to transport its egg in its mouth, what hinders us from believing that she does so, especially when so many instances are recorded of the egg being found in nests into which it was quite impossible for so large a bird to have entered? and when, in almost all cases, to sit on the nest selected (excepting when it happens to be on the ground) must be a work of considerable difficulty for so disproportionate a form? But the strongest argument in support of this theory yet remains to be stated: it is from analogy. La Vaillant and his faithful attendant, the Hottentot Klaas, killed *several* specimens of an African cuckoo (*Cuculus auratus*) in the very act of transporting their eggs in their mouths: this fact added to the above reasons seems to me to point very clearly to the method adopted by our English species. And I conclude that many species of birds do *occasionally*, as exigency requires; and that the cuckoos do very *frequently*, carry their eggs from one place to another in their *beaks*.

And now in regard to removing their *young*. No one can doubt that the parent birds of some species *must* contrive to effect their removal by *some* means, when the young are quite unable to assist themselves. Thus, several species of ducks build in holes of trees at a considerable height above the ground, and they must carry their progeny to the water, if they would not see them break their necks in endeavouring to descend. The woodcocks and terns generally breed at a considerable distance from their feeding places, whither unaided it would be quite impossible for their newly hatched young to follow them, and yet there they may be seen with their parents. The guillemots and razorbills breed on lofty and precipitous cliffs, but their young, on first emerging from the egg, are only clothed with down, and must be dashed in pieces against the rocks, if they attempt

to flutter down, and yet they too are often seen safely arrived and sporting on the waves below. In all these cases then the removal of their young by the parents must be a regular and systematic habit of the species. But we have other accounts of species not accustomed to remove their offspring, but which in time of danger or sudden emergency have contrived to bear them away. Thus Mr. Edmondston (Zool. 37) records how the sea eagle, having been disturbed in her eyrie by the prying eyes of a daring fowler, contrived to remove her nest and young to a considerable distance, and across a deep creek. The moorhen is recorded on more than one occasion to have made its nest in a tree, whence the chicks must have been carried to the water; and many other similar instances have been observed. How then are these removals effected? I answer, that in this case the same method is not always employed: for to perform so delicate an operation as the removal of a tender newly hatched chick, the greatest gentleness is requisite, and so different species adopt different means, according as their own formation best enables them to grasp their charge without injury. It is manifest that the webbed feet of the ducks would be quite incapable of holding without a severe squeeze the delicate duckling, while their broad flat beaks seem admirably adapted for taking them gently and yet securely. On the other hand, the long thin beaks of the Scolopacidæ seem but poor instruments for holding their young, while their feet are so formed as to enable them to take them up without injury. Again, the guillemots have neither beak nor feet adapted for the purpose, so they employ a third method, and make a cradle of their backs: while others, as the golden eyes, convey them under their throats: and others again, as the grebes and the allied families which seek their safety in diving, contrive to take their young under their wings, and so descend with them to the bottom of the water, till the danger is over. There are different methods by which different birds bring about the same result; and I proceed to prove this from the recorded testimony of eye-witnesses and others.

Some species use their "*beaks*:" for the truth of which assertion we need go no farther than Mr. Yarrell. Speaking of the ruddy sheldrake he says, "when the young come forth, the mother will often carry them from the place of hatching to the water with the bill:" and of the common sheldrake, "when the young are hatched, they follow their parents, and in some situations are even carried by them in their bills to the water:" of the eider duck, "the young as soon as hatched are conducted to the water, and this, in some instances, must

be effected by the parent carrying them in her bill : ” of the hooded merganser, “ the young, like those of the wood duck, are conveyed to the water by their mother, who carries them gently in her bill.” And the same proceeding is recounted of several other species. Selby, too, in describing the nest of a wild duck high up in a tree, expresses his opinion that the young were conveyed to the ground in their parent’s bill.

Others use their “*feet*.” Thus, Bishop Stanley says that the ring dotterel is enabled on the appearance of danger to carry its young out of harm’s way : and states that on a rocky shore in Anglesey one of these birds “ finding herself surprised, immediately rose with one of the young ones, either caught up or clinging to her by its own instinctive efforts.” The same author recounts how a brood of young owls having been taken from their nest, and placed on a barn-floor, the parent birds “ gliding down to them, entwined their feet about them, and carried them back to the nest : ” and that as often as the young were brought away, so often did the old ones convey them back in the same manner. And another instance of the owl carrying away her only young one in her claws on a sudden alarm is given in Couch’s ‘ Illustrations of Instinct.’ Jesse, in his ‘ Gleanings,’ speaks of a skylark rising out of some stubble, and crossing the road, with a young one in its claws ; though on this occasion, the old proverb of “ out of the frying-pan into the fire ” was certainly fulfilled, for the poor chick was dropped and killed by the fall. But the principal instance which I have to adduce of birds removing their young in their claws is the woodcock : breeding as it usually does in dry situations, in thick cover and among dead grass, fern and leaves, it is often necessary to remove its newly hatched young ones to a great distance, for the purpose of feeding : this was perceived by naturalists of the last century : but when Scopoli jumped to the conclusion that the *beak* was the means employed, and wrote, “ pullos *rostro* portat fugiens ab hoste,” the accurate observer of Selborne (though candour forbade him to deny the truth of the statement, against which he could bring no proof) remarked, “ that the long, unwieldy bill of the woodcock is perhaps the worst adapted of any among the winged creation for such a feat of natural affection,” and declined belief in it. Gilbert White (as usual) was correct. Yarrell speaks of gamekeepers and others having often witnessed the woodcock in the act of bearing away its young in its claws. St. John, in his ‘ Highland Sports,’ mentions it as a well ascertained fact, adding, that the old bird “ lifts her young in her feet, and so carries them one by one : ” and Stanley

gives additional instances. But by far the most valuable information on this whole question has been just furnished us by the great English hunter of the North (Mr. Lloyd), in his admirable work on 'Scandinavian Adventures,' (London: Bentley; 1854): a work, which coming from such a trustworthy source, and from such an outdoor and thoroughly experienced observer, must be highly valued by all naturalists and sportsmen, and the perusal of which (as it has given me a great deal of pleasure, so) I strongly recommend to all who take interest in the different branches of Zoology: and from which I shall now take the liberty of making some considerable extracts. In the second volume (the latter part of which is devoted to a brief but comprehensive account of the Scandinavian Ornithology), Mr. Lloyd says, "It was mentioned in my former work, on the authority of Mr. Greiff, that the woodcock, when her young are in jeopardy, will grasp them with her feet, and fly away with them to a place of safety. Swedish naturalists and others question the truth of this statement, but it would seem without sufficient cause. Not to speak of the same story being current and believed in England, my friend M. Otendahl, in whose word I have full confidence, was an eye-witness to the fact. 'Once during a hare-hunt,' he writes, 'I myself shot a woodcock, flushed by the dogs, when flying at about six feet from the ground, that was bearing an unfledged young one in her claws. It seemed to me she grasped it by the wings; one foot having hold of the one wing, and the other foot of the other. Though in consequence of intervening boughs, I did not observe the old bird when she rose, I was fortunately so near to her as clearly to see what I have stated: I afterwards found two other young ones under a neighbouring bush, where they had retreated for shelter.'" A woodcut is added exemplifying the above description.

Again, other species convey their young on their "*backs*." Thus, Mr. Waterton was told by the rock-climbers that the young guillemots descend safely to the ocean in this manner, and gave credit to the statement, from seeing them when quite unable to fly, sporting on the sea. Yarrell bears testimony to the same fact: and Mr. Bury (Zool. 975) expresses his belief in it. Most people who have had opportunity of watching the mute swan sailing on our lakes or rivers, will have occasionally seen a cygnet carried on its parent's back: and Yarrell tells us that he has "seen the female, by raising her leg, assist the cygnets in getting up." The eider duck, too, is said to carry her newly hatched brood on her back, and Mr. Lloyd says, "From the elevated and broken nature of the ground where the eider

frequently breeds, it seems pretty certain, that without aid of some kind, the young can never reach the water. But in what manner their transit is effected appears somewhat a mystery. I was assured, however, by a very respectable individual, the Superintendent of Winga lighthouse, that he himself had often seen the old bird thus occupied. 'She threw her progeny over her neck,' such were his words, 'as a fox would a goose, and thus bore them away to their own element.' It is generally believed in Scandinavia, that when her young are in jeopardy, the eider, as with the merganser, and some other birds, takes her young on her back, and either swimming or diving, thus conveys them to a place of safety. But this is probably a fallacy: it is true that when the body of the old bird is submerged, which is always the case when danger threatens, and that the young brood are collected about her, it looks much as if they were actually seated on her back; but if this were so, they must hold fast by the bill, which they clearly never do, their heads at such times being quite erect."

Again, close observation has proved that some birds convey their young under their "*throat*," beneath the beak, and between that and the neck. Thus, in speaking of the golden eye, Yarrell gives a very interesting account from a clergyman in Lapland, who watched the old bird fly backwards and forwards from the tree in which the nest was built to the water, bringing down a young one after each visit, "holding it under the bill, and supporting its body by her neck." Lloyd, also, speaking of the golden eye, and quoting from the 'Proceedings of the Academy of Sciences at Stockholm,' says, "Whilst the Pastor Björkman and his servant were lying in ambush near to a lake, in the parish of Jockmock, in Lulea Lapmark, to shoot velvet ducks, they saw from their place of concealment a female golden eye alight amongst some willow bushes very near to them. An instant afterwards, however, she again took wing, and, as they imagined, in consequence of having observed them. But looking with attention towards the spot where she had been, they noticed in her place a newly hatched young one. They now began to wonder in what manner it came there, when just at the moment the old bird returned to the same place, and after depositing a second duckling, flew off hurriedly as before. As yet they had not been able to distinguish in what way she carried her offspring; but on her third visit they remarked her head to be inclined in a very peculiar manner; and on the following, they clearly perceived, that in a sort of *Ögla*, or hollow, formed by the head and bill resting on the breast, she conveyed them under her throat. This account tallies also with the relation of the

squatters as to the mode in which the female golden eye transports her young from her nest in lofty trees to the water." And again, in speaking of the goosander, "As with the golden eye, the point is much mooted in Sweden regarding the way in which the goosander, when it nests in a hollow tree, and often at a height of from twenty to thirty feet, gets its young to the ground, which it is known to do the night after they are hatched. Some imagine that whilst in the nest, the poults get on to her back, after which she slowly creeps out of the cavity, and thus burthened, either descends with outstretched wings, and half-hovering, as it were, to *terra firma*, or cautiously takes her flight to the nearest water. Others contend, and with a much greater show of reason, that she takes them up in her bill, and in this way carries them to their native element."

There is but one other method of removing their young which has been observed, and that is peculiar to the grebes, and such-like divers. These, when danger threatens, carefully conceal their young beneath their "*wings*," and so dive out of sight. Yarrell relates how Mr. Proctor, when in Iceland, shot several Sclavonian grebes, which came up from diving with their young under their wings; and how the great crested grebe adopts the same precaution, when alarmed. A correspondent in the '*Zoologist*' (Zool. 1182) affirms that the little grebe, or common dabchick, does the same. Hewitson and Stanley speak of it as the general habit of the Colymbidæ: and both those writers state that the inhabitants of the Orkneys, from seeing them take their young under their wings for protection, are fully persuaded that in lieu of making nests like other birds, and sitting on their eggs, the great northern divers carry them about with them under their wings in a hole expressly provided for that purpose, Lloyd says that the same belief is generally entertained in Scandinavia, and quotes the following remarkable passage from Pontoppidan:—"On inquiring how they (the immers) find place and opportunity to hatch their young, I have been informed they lay but two eggs, which is very likely; for one never sees more than two young ones with them. Under their wings in their body, there are two pretty deep holes, big enough to put one's fist in; in each of these they hide an egg, and hatch the young ones there as perfect, and with less trouble, than others do on shore." The good old Bishop evidently believes this account, and tries to link in as a partner in credulity another, whom he considers "a pretty cautious writer:" though, like Herodotus, he is careful to conclude his most marvellous stories with such words as "*relata refero, sed constanter et a plurimis relata.*"

Such then are the means employed by birds, as necessity requires, for removing their eggs and young. Ingenious as they daily show themselves to be in a thousand ways, in nest building, in procuring their food, in providing for their young, &c. ; yet, when emergencies occur, they seem to rise above themselves, and astonish man by their clever devices : though timid and easily scared at other times, yet, when the occasion demands it, instead of terror and helplessness, they show energy and courage, and, I may almost add, *presence of mind*. They seem to know exactly how to act, and they do it in the best possible way. Though they have not reason, yet we need not marvel at their expedients. They are undoubtedly gifted with a large proportion of what we call "instinct," or, as the poet has more beautifully and plainly expressed it,

"The God of Nature is their secret guide."

ALFRED CHARLES SMITH.

Yatesbury Rectory, Calne,
March 17, 1854.

Note on Hybrid Gallinaceous Birds. By J. W. G. SPICER, Esq.

I SHOULD wish to correct an error into which your correspondent has fallen in the April number of the 'Zoologist' (Zool. 4253), viz., that a hybrid between the black grouse and pheasant which he reports near Derby, is the first specimen recorded since the thirteen named by Mr. Yarrell in his 'History of British Birds.' I beg to refer him to the 'Zoologist' for April, 1851 (Zool. 3091), where a specimen in my possession is mentioned as having been shown at an evening meeting of the Zoological Society, and which was shot at Henley Park, near Guildford, Surrey, by the keeper of H. Halsey, Esq. This last specimen therefore makes the fifteenth recorded example of the cross. As you may think it perhaps worthy of insertion in the 'Zoologist,' I will add to this communication some notes made at the time with regard to my hybrid bird, and two other hybrids, between the common and golden pheasants shown at the same meeting of the Zoological Society, and also shot at Henley Park.

The hybrid between black grouse and pheasant was shot on the edge of a covert in a wild tract of country not far from Frimley Ridges, and where there are a good many black game still. As far as I can

ascertain in the number of instances of hybrids mentioned in Yarrell's 'British Birds,' they are all the supposed produce of cock pheasants and gray hens, whereas I think there is no doubt that this bird is the reverse, as it appears that a black cock had for two years previously to this bird being shot, frequented that particular covert, and fed with the pheasants. The keeper has frequently seen them at feed together, and the old black cock used to play like a cock turkey, dragging his wings, and driving the cock pheasants, he being completely the master of them, which is rather to be wondered at, as the pheasant has spurs, the black cock none. The hybrid was shot on the 26th of October, 1850, and I have no doubt he is the result of an intimacy between this bird and a hen pheasant. You can trace the plumage of his two parents throughout. He is a male bird; his head and beak most like a pheasant's; the body of a rich chestnut and black; the tail the colour of a hen pheasant's, and fan-shaped: he has no spurs; his legs partially feathered; no white tips on the wings.

In another wood on the same property, two hybrids were produced between the wild cock pheasant and hen golden pheasant; this took place about thirteen years ago. A hen golden pheasant had escaped from confinement some time previously, and it was known that she was about in the coverts; and at last, in one particular wood, it was remarked that the pheasants were always disturbed, and driven out of it, and it was not known for some time by what, till at last the keeper discovered that this hen golden pheasant and two other curious looking birds were so pugnacious that they drove everything from the place. They were all three shot, when the other two proved to be cock birds, and there is no doubt whatever of their parentage, both from their shape and plumage. They are small birds, and not handsome, partaking of the plumage of both sorts of pheasants without the beauty of either. They were shot in the month of November, and therefore probably not in as good plumage as they would have been. They have no spurs, which I suspect to be the case with all hybrids, as I have one between the pheasant and common fowl, a male bird, which has none, also the black grouse hybrid, above. I believe this to be the first instance on record of the common and golden pheasant breeding in a wild state; and this was not in a Norfolk covert full of half-tame pheasants, but in one of the wildest parts of England, as the presence of black grouse will show. I find in the 'Gardens and Menageries of the Zoological Society,' vol. ii., under the head of "Golden Pheasant," that in China, where the two pheasants are wild, they have never been known to produce a

mixed breed, and that in confinement it is sometimes obtained, but very rarely. Also, in the 'Natural History of Ireland,' vol. ii., Birds, by W. Thompson, it is stated as a reason for the golden pheasant not doing well in a wild state in this country, if introduced where the common pheasant abounds, that they are so shy and timid a bird, that they are easily driven off by the other species. The fact of these two birds rather proves the contrary, as not only the half-bred birds but the golden hen drove all the other pheasants, as was frequently seen by the keeper. I believe the golden pheasant to be a very pugnacious bird. These birds were so cunning and so well able to take care of themselves, that after it was known they were there, and the mischief they did, the covert was beat closely in the usual way for pheasant, in the hope of being able to destroy them, but without meeting with them, and the keeper received orders at last to watch for them and shoot them at feed, which he did. These birds are now in my collection, through the kindness of Mr. Halsey.

Since these notes were written, I have seen a specimen of the same hybrid between a common and golden pheasant, which was sent to Mr. Leadbeater for preserving, but bred in an aviary. He is rather larger and handsomer than my two birds, but very similar in plumage. A specimen has also been recorded in the 'Zoologist,' if I remember right, since the date of my birds being shot, and this was also bred in confinement.

JOHN W. G. SPICER.

Witley House, near Farnham, Surrey.

April 2, 1864.

Occurrence of the American Stint (Tringa pusilla) near Penzance.

By E. H. RODD, Esq.

I THINK that an undoubted example of this *Tringa*, new to the British Fauna, may be recorded as having been obtained from Mount's Bay during the month of October last; and having this day minutely examined the specimen as preserved by Mr. W. H. Vingoe, who shot the bird, and drew my attention to its specific value, I have no hesitation in sending to you a few particulars of this new *Tringa*. The bird was found singly in a piece of wet grass-land adjoining the sea-shore, and when it rose, Mr. Vingoe observed that it was silent; whereas in the other two species, viz., the little and Temminck's

stints, he has always observed that both these birds uttered, on being flushed, a hurried repetition of a feeble note, which may be expressed by the word "weet."

The dimensions, &c., hereafter referred to, I have copied from Mr. Vingoe's written particulars, and which I have compared with the example with a view of testing their accuracy.

Perhaps the most remarkable external differences are the superior dimensions of the feet, and the colour of the outer tail-feathers, which in this bird are light brownish gray; the same in *Tringa Temminckii* being pure white: the general appearance of the bird is smaller than the other two, and the bill is rather longer and more deflected, with the point less obtuse and rounded. Although the dimensions of the tarsus perfectly agree with those of *T. Temminckii*, the colour and shape of the tail are precisely similar to those of *T. minuta*.

Mr. Vingoe's description of Tringa pusilla (minutilla).

"From the carpus to the end of the wing three inches and seven-sixteenths long, which is three-eighths of an inch shorter than that of the little stint, or of Temminck's stint. Tarsus the same length as that of Temminck's stint (eleven-sixteenths). The middle toe, claw included, full three-quarters of an inch long, which is nearly one-eighth of an inch longer than that of the little stint or of Temminck's stint. Primaries only an eighth of an inch longer than the tertials, whilst in *T. minuta* the longest primary is five-eighths of an inch longer than the tertials; and in Temminck's stint the longest primary feather is half an inch longer than the tertials. Bill three-quarters of an inch long, a little curved and more pointed than in either the little stint or Temminck's stint. Plumage, tail included, similar to that of *Tringa minuta*, but of a darker shade throughout. Legs grayish yellow."

The first British example of this *Tringa*, shot in Marazion Marsh, near Penzance, October 10th, 1853, by Mr. W. H. Vingoe.

EDWARD HEARLE RODD.

Penzance, March 27th, 1854.

[The following addition from Wilson's 'American Ornithology' will be interesting to our readers.—*E. Newman*].

"Little Sandpiper, *Tringa pusilla*, Wilson."

"THIS is the least of its tribe in this part of the world, and in its mode of flight has much more resemblance to the snipe than to the

sandpiper. It is migratory, departing early in October for the South. It resides chiefly among the sea marshes, and feeds among the mud at low water; springs with a zigzag irregular flight, and a feeble twit. It is not altogether confined to the neighbourhood of the sea, for I have found several of them on the shores of the Schuylkill, in the month of August. In October, immediately before they go away, they are usually very fat. Their nests or particular breeding places I have not been able to discover.

"This minute species is found in Europe, and also at Nootka Sound on the western coast of America. Length five inches and a half; extent eleven inches; bill and legs brownish black; upper part of the breast gray-brown, mixed with white; back and upper parts black; the whole plumage above, broadly edged with bright bay and yellow ochre; primaries black; greater coverts the same, tipped with white; eye small, dark hazel; tail rounded, the four exterior feathers on each side dull white, the rest dark brown; tertials as long as the primaries; head above dark brown, with paler edges; over the eye a streak of whitish; belly and vent white; the bill is thick at the base, and very slender towards the point; the hind toe small. In some specimens the legs were of a dirty yellowish colour. Sides of the rump white; just below the greater coverts, the primaries are crossed with white.

"Very little difference could be perceived between the plumage of the males and females. The bay on the edges of the back and scapulars was rather brighter in the male, and the brown deeper."

*Note on Nestor productus, the extinct Parrot of Philip Island.**—"I have seen the man who exterminated the *Nestor productus* from Philip Island, he having shot the last of that species left on the island; he informs me that they rarely made use of their wings, except when closely pressed: their mode of progression was by the upper mandible; and whenever he used to go to the island to shoot, he would invariably find them on the ground, except one, which used to be sentry on one of the lower branches of the *Araucaria excelsa*, and the instant any person landed, they would run to those trees and haul themselves up by the bill, and, as a matter of course, they would there remain till they were shot, or the intruder had left the island. He likewise informed me that there was a large species of hawk that used to commit great havoc amongst them, but what species it was he could not tell me."—*J. H. Gurney; Easton, Norfolk, April 7th, 1854.*

Occurrence of the Little Olivaceous Gallinule (Ortygometra pusilla) at Balbriggan.—I received this morning a fine specimen of the little olivaceous gallinule, in the

* Communicated by Mr. F. Strange, of Sydney, to Mr. J. H. Gurney, under date of December 7th, 1853.

flesh, shot on Friday, the 11th instant, at Balbriggan, Dublin, by my friend, H. A. Hamilton, Esq., who informs me it is not the first of the kind he has killed there this winter. It measured $7\frac{1}{2}$ inches in length; the expansion of the wings $11\frac{1}{2}$ inches; and weighed 1 ounce 6 drachms. On dissection, it proved to be a male, and though so much below the weight usually given, was very fat. This is, as far as I can ascertain, the first occasion on which the least crake has been observed in Ireland. Baillon's crake is only recorded as having occurred there once.—*H. B. Tristram; Castle Eden, Durham, March 13, 1854.*

*Note on a Luminous Fish.**—As there are but very few fishes which have hitherto been observed to emit a regular phosphoric light from determined parts of the body, and as the published notices about this phenomenon are so scanty, I am induced to submit the following instance which occurred to me in two specimens of *Astronethes Fieldii* of Valenciennes, a fish in which nothing of the kind has hitherto been remarked. Under other circumstances I should perhaps have hesitated to mention the subject, because I had no opportunity of closely investigating the luminous apparatus in the fresh fish. This little fish is extensively spread over a considerable part of the Atlantic ocean, and appears to be common between the 23rd and 6th degrees of North latitude. I have seen a number of specimens in the Zoological Museum of our University, which had been caught between those parallels of latitude; and I have myself got several during my voyage to Brazil in the summer of 1850. It was, however, after sunset only, that I discovered the fish in the drag net; and, without meaning to draw any general conclusion from this circumstance, which, after all, may have been purely accidental, it seems proper to hint that it is only at that time that the surface of the ocean begins to be crowded by vast swarms of Pteropoda and the numerous Crustacea, and that possibly the fish searches for food among them, following them into greater depth during the daytime. Most of my specimens were entirely mutilated by the pressure of the sea against the net; but in two instances I was so fortunate as to catch the fish alive, when I saw that it sent forth two strong and vivid greenish lights, which intermitted momentarily, and ceased altogether when the fish died. As the two individuals only lived a few minutes after being taken out of the net, and as the luminous appearance only showed itself distinctly in the dark, it was not until I procured a second specimen, a number of days after the first was obtained, that I ascertained with certainty, that the light radiated from a spot in the forehead, a little before the eyes, flashing, as it were, from thence along the back as far as the first dorsal fin; all the rest of the body remained perfectly dark. On examining the whitish speck in the specimen preserved in spirits, from whence the light radiated, a cellular tissue is found underneath, or rather within the skin, consisting of largish cells or meshes, filled with an apparently fatty substance. No doubt

* Read by J. Reinhardt before the Association of Naturalists at Copenhagen, on the 18th of February, 1853. Translated by Dr. Wallich, and obligingly communicated by Mr. Spence.

this is the source of the phosphoric light, although I have not been able to trace the substance, at least not in an aggregate form, beyond the eyes, so as to account for the extent backwards of the phosphorescence."

*A List of the Mollusca hitherto found in the Province of Moray and in the Moray Firth.** By the Rev. GEORGE GORDON.

To the mere general reader, "lists" of animals low in the zoological scale are, both in matter and manner, peculiarly repulsive, and have encouraged the notion of some that Natural History was at best but the knowledge of names. When such catalogues, however, are pretty full, and when they are restricted to a well-defined district, the following advantages may be adduced in their favour. They record the progress of scientific discovery within their several localities; they inform the naturalist at a distance of the range of species; they enable the systematic writer to compile more fully, and to generalise more accurately, than he could have done in their absence; they afford facilities for the exchange of specimens; they prevent future observers from falling into the too frequent error of assuming the credit due to earlier discoverers; and they form a nucleus, even when meagre, around which the addition of another and yet another species gives a far higher gratification than if there were no such guide to mark the known from the hitherto unknown denizens of the particular locality. But the readers of the 'Zoologist' need no such apologetic and preliminary statements in order that such lists may gain a share of their attention. The naturalist, while he runs his eye along such columns, feels many a pleasing suggestion to arise in his mind. In the mere name of many a species he reads a little history. Its form or sound calls up a thousand agreeable thoughts and recollections of by-gone days, — of fond companions, — of early adventures by flood and by field, — how, when, where, and with whom he first culled the flower or gathered the shell, — how often, and the changing circumstances and scenes in which he has since met with it. Such and many kindred associations recur; and with an inward but exquisite delight he fights, as it were, his battles over again. Moreover, as special reasons for compiling and publishing these lists illustrative of the Fauna of Moray, a degree of *amor patriæ* is to be confessed, — a

* In continuation of "The Fauna of Moray." See 'Zoologist,' pp. 421, 502, 551, 3454, 3480, 3678, and 3781.

desire that others may know some of the zoological rarities and treasures "the Province" possesses;—and a conviction that these lists will be of interest, if not of use hereafter, when the subjects they refer to will engage more than they now do of the recreative hours of all classes of society.

This list indeed may be looked upon as among the first-fruits of 'The History of British Mollusca,' by Messrs. Forbes and Hanley; for assuredly without the assistance found in this new and incomparable work, any attempt to discriminate and enumerate the Mollusca of Moray would not at present have been made, or, if made, it must have fallen far short of the point of success it has now reached. The order and scientific nomenclature, adopted by the authors of 'The History,' are here implicitly followed; but, as this splendid and valuable work has not yet reached the wide circulation which its merits will obtain for it, synonymes are taken from Dr. Fleming's 'British Animals,' and Professor Macgillivray's 'Aberdeenshire Mollusca,' which have been deservedly valued, and hitherto consulted and followed by most zoological observers in the North of Scotland. Most of the English names here given are extracted from the 'Aberdeenshire Mollusca,' a few others are but translations of the Linnean terms. The names of the discoverers of the rarer species have been carefully recorded, as far as known; and the frequent recurrence of some names will show that much credit is due and much success has attended their researches in this branch of Natural History. The labours and success of Mr. George Murray, Free Church Schoolmaster, at Burghead, deserve especial notice. The discoverer in this district of many species among the other tribes, he has filled up a void which, without his assistance, would have occurred among the Nudibranchiæ, and which must have left this list but a very imperfect record of those species of the beautiful tribe that inhabit the waters of the Moray Firth. In proof of the value and extent of Mr. Murray's discoveries, the following extract is given from a letter to him from Mr. Hancock, one of the accomplished authors of 'The Monograph of British Nudibranchiate Mollusca':—"I was very glad to receive a list of the Nudibranchs of your coast, as we are preparing for the concluding part of the Monograph, and it will help us to more correct views respecting the distribution of those hitherto much neglected, though highly interesting and beautiful animals. From the length of the list, it is evident that you must have searched diligently the last two years, and that your coast is richly supplied with species."

In the Introduction to 'The History of the British Mollusca,' it is said that four, perhaps six separate districts must be visited before a conchologist could personally collect a complete set of British shells; viz., the Channel Islands, the South-West coasts of England, the West coasts of Scotland, the Zetland Islands, the northern half of the German Ocean, and the West coasts of Ireland. The Moray Firth, or that triangular inlet or arm of the German Ocean, which has Peterhead, Inverness, and Duncansbay Head at its angles (Zool. 3455), of course must be assigned to the fifth of these districts. However, it will be seen from the following enumeration that it contains many species whose chief British habitat is the fourth or Zetland area: this may be accounted for by the strong tidal current that sets into it from the North through the Pentland Firth. Messrs. Forbes and Hanley also state in the Introduction (p. xvii.) that "our marine molluscan Fauna, when considered with respect to its home arrangements, may be said to be composed of examples of no fewer than nine types," viz., the Lusitanian, the South British, the European, the Celtic, the peculiarly British, the Atlantic, the Oceanic, the Boreal, and the Arctic. Although the following list comprehends all but one (*Syndosmya alba*) of the forty-three species given as characteristic members of the *European*, and all but four (*Lacuna puteolus*, *Mangelia turricola*, *Thracia distorta*, and *Trophon muricatus*) of the forty-six species characteristic of the *Celtic* type, yet the northern locality and already ascertained molluscan products would, it is presumed, fix the Moray Firth as one of those places that chiefly yield examples of the *Boreal* or eighth type, thus described:—"VIII. We have before remarked that in the northern division of the British seas there are many species either not found more to the South, or else becoming rarer as we proceed southwards. Some of them, too, are only to be met with in peculiar and limited localities, grouped together like isolated colonists. The majority of these northern forms belong to an assemblage that constitutes the *BOREAL* type of our molluscan Fauna. They are all species that thrive best in seas to the North of Britain, and many of them range across the Boreal Atlantic, or, at least, are found on both sides, but only within cold waters. They are not, however, to be considered as strictly Arctic. To this group we may assign such examples as *Acmæa testudinalis*, *Astarte compressa* and *elliptica*, *Cardium Suecicum*, *Cerithium metula*, *Chemnitzia fulvocincta*? *Chiton Hanleyi* and *marmoreus*, *Crania anomala*, *Crenella nigra*, *Cyprina Islandica*, *Emarginula crassa*, *Fusus Norvegicus* and *propinquus*, *Hypothyris psittacea*, *Leda caudata* and *pygmæa*,

Mangelia nana, *Natica Helicoides*, *Nucula tenuis*, *Panopæa Norvegica*, *Pecten Danicus*? *Philine quadrata* and *scabra*, *Pilidium fulvum*, *Puncturella Noachina*, *Syndosmya intermedia*, *Thracia convexa*, *Trichotropis borealis*, *Trochus alabastrum*, *helicinus*, and *undulatus*, and *Velutina flexilis*. A considerable portion of our Ascidians belong to this type." Every one of these species has already been found in the Moray Firth, or both to the North and to the South of it in the German Ocean, except *Cerithium metula*, *Emarginula crassa*, *Hypothyris psittacea*, *Leda pygmæa*, *Mangelia nana*, *Pecten Danicus*, *Syndosmya intermedia*, *Thracia convexa*, and *Trochus undulatus*.

The observations, however, upon which the following list has been drawn up, having been made chiefly on the south-western or Elginshire coast,—but a small portion of its lengthened boundaries,—the species here enumerated must not be looked upon as by any means exhausting the Mollusca of the Moray Firth. Additions will no doubt be hereafter made even from within this comparatively narrow corner of its wide waters. Its more northern bays and creeks, and its undredged depths, will afford to future observers much new and interesting information, both as to the distribution and economy of its already known denizens, as well as of others not yet detected.

Still more confined has been the field of observation in reference to the land and fresh-water Mollusca of the Province of Moray. A circle of a few miles around the town of Elgin would nearly comprehend all the ground from which any information has as yet been drawn regarding these tribes. Few additions to the species given are indeed to be expected; but much has yet to be ascertained regarding their absence or distribution among the lakes and rivers, the woods, the plains, and the hills of this district in the North of Scotland, early known as "The Province of Moray," and which may in general terms be described (Zool. 421) as including the surface drained by the river Spey on the East and by the Beaully on the West, and the broad extent of intervening country rising from the sea level to that of the higher Grampians.

Acephala tunicata.

Schlosser's *Botryllus*, *Botryllus Schlosseri*. On *Flustra foliacea* and *Alcyonidium gelatinosum*, brought up by the fishermen's lines, at Lossiemouth, March, 1858.

Intestinal Ascidia, *Ascidia intestinalis*, (*Ciona intestinalis*, Flem.) This species must be common in the Firth, as appears from the frequency with which it is brought ashore in the fishing-boats.

Opaline Ascidia, *Ascidia virginea*, (*A. opalina* of Macgillivray). "Moray Firth, Captain Otter," *Forbes & Hanley*. Very common.

Coarse Ascidia, *Ascidia sordida*, (Alder & Hancock). Mr. Macdonald, of the Elgin Academy, finds an Ascidia which agrees very well with the description of this species (*Brit. Mollusca*, vol. ii. p. 372), and which is not uncommon in the Moray Firth.

Sandy Molgula, *Molgula arenosa*. An occasional portion of the food of the haddock. "Abundant, in about fifteen fathoms on a sandy bottom off Lossiemouth, August, 1852," *Mr. Macdonald*.

Wrinkled Pelonaia, *Pelonaia corrugata*. Also preyed upon by the haddock. Several were found by Mr. Macdonald, on a fisherman's line, at Branderburgh, 1858.

The above must form but a poor enumeration of the Tunicata of the Moray Firth; and it is to be feared that little progress will be made in the further identification, by casual observers, of the various forms found in its waters, until the appearance of the promised work on this tribe by Professor Goodsir: (See *Forbes & Hanley's 'History of British Mollusca,'* vol. i. p. 3). The Botryllidæ especially appear to be well represented, Messrs. Macdonald and Murray having observed at Burghead nearly a dozen distinct forms, some of them identical with those figured (only) by Sir J. G. Dalyell: (*'Rare Animals of Scotland,'* vol. ii. plates 40 and 41).

Acephala lamellibranchiata.

Curled Pholas, *Pholas crispata*. "Moray Firth (McAndrew), *F. & H.* Valves are frequently found on the shore, particularly between Stotfield and Covesea, and sometimes so fresh in their appearance as to indicate that their native locality is at no great distance from the shore. Found also in a fossil state in submarine peat on the west side of Burghead. Mr. Murray has (October, 1853) discovered it alive in abundance in argillaceous sandstone strata at Burghead.

White Pholas, *Pholas candida*. Bay west of Burghead, along with the preceding in peat. "Peterhead," *Macgillivray*.

Arctic Saxicava, *Saxicava arctica*, (*Solen purpureus* and *Hiatella arctica*, Flem.) Abundant, all along the shores of the Firth. Well-marked specimens, young, in the shell-sand found at Burghead, &c.

Wrinkled Saxicava, *Saxicava rugosa*, (*Hiatella rugosa*, Flem.) Frequent. Occasionally found in limestone; often in the roots of the larger Fuci.

Abrupt Gaper, *Mya truncata*. "Dead valves in thirty-four fathoms ten miles from shore off Elgin (R. McA.)," *F. & H.* There are two good localities for collecting specimens of this shell (almost invariably consisting however of single valves); one of them is the extensive range of sand which stretches along the shore from Lossiemouth to the Blackhill, near the influx of the Spey, and the other the bay between Burghead and Findhorn. In both places valves are to be met with at a considerable distance inland beyond high-water mark, being cast ashore at some earlier period, or by some more than usually violent storm. Very young specimens were found in considerable numbers, with multitudes of young *Macra stultorum*, on the shore east of Lossiemouth in 1853. "Peterhead, Frazerburg, and Gamrie," *Macgillivray*. Also observed in a collection of shells, &c., made chiefly on the Banffshire coast by Mr. Thomas Edwards, lately sent by him to be named, and in this list afterwards noticed as "Edwards' collection."

Sandy Gaper, *Mya arenaria*. Abundant in Findhorn Bay. It is there regularly dug up from the sand, not only by the fishermen of the adjoining village, but also by those of Burghead, who readily go the distance of eight miles for so favourite a bait for their lines. In that district of coast this shell-fish is popularly known by the name of "badgers," the origin or cause of application of which it were difficult to discover. It is not improbable that *Panopæa Norvegica* may yet be added to the list of the Moray Firth species, since it has been found in "Zetland," and also "in deep water off the Northumberland and Durham coasts," *F. & H.*

Common Corbula, *Corbula nucleus*, (*C. stricta*, Flem., *C. inequivalvis*, Mac.) Burghead, *Mr. Murray*. "Not uncommon in the Firth, wherever the bottom is muddy," *Mr. Macdonald*. Rarely found in the stomachs of fish. "The curious and interesting shell," *Næra cuspidata*, having a range including Zetland and the Firth of Forth, is an object for discovery in that arm of the German Ocean so frequently referred to in this list.

Pearly Lyonsia, *Lyonsia Norvegica*, (*Mya Norvegica*, Flem.) Messrs. Forbes and Hanley state that it has been dredged "in thirty-four fathoms on the Elginshire coast." *Mr. Macdonald* dredged a fine specimen, now in the Elgin Museum, in thirty-five fathoms off Lossiemouth, 9th of June, 1853, and has also obtained it from Buckie. A mutilated specimen, found in 1850, in the stomach of a fish killed in the Moray Firth, retained sufficient marks, particularly in its curiously

constructed hinge and "testaceous heart-shaped ossicle," to show that it belonged to this species.

Bean-shaped *Thracia*, *Thracia phaseolina*, (*T. pubescens*, Mac., *Amphidesma declivis*, Flem.) Not common. Occasionally met with on sandy shores, as at Lossiemouth, January, 1853, and in the boats just returned from sea. Mr. Murray has obtained some very fine specimens from the Burghhead boats. Banffshire coast, *Edwards' collection*.

Macgillivray's *Thracia*, *Thracia villosiuscula*. Apparently rare. A single specimen, now in the Elgin Museum, was found by Mr. Murray at Burghhead; one from Buckie, Mr. McDonald; and one from Lossiemouth, Mr. C. H. Grant. A single valve has been taken from the stomach of a codfish. The following quotation, from the 'History of British Mollusca,' encourages the hope that *Thracia distorta* will yet be detected in the Moray Firth. "The Rev. G. Laing communicates it (*T. distorta*) from the Orkneys, and we have found it in the Firth of Forth, (E. F.)" vol. i. p. 234.

Delicate *Cochlodesma*, *Cochlodesma prætenue*, (*Amphidesma p.*, Flem., *Anatina p.*, Mac.) "The Moray Firth (McAndrew)," *F. & H.* Burghhead, *Mr. Murray*. Buckie, *Mr. Macdonald*. Occasionally to be picked up in the Lossiemouth boats. On this species Mr. Macdonald gives the following remarks:—"Though a scarce British shell, *Cochlodesma prætenue* is by no means uncommon in the Moray Firth. It may be procured either by the dredge or from the fishermen's lines; and examples often occur an inch and a quarter in length by seven-tenths in breadth. The late Professor Macgillivray states (*Moll. Aberd.* p. 295) that it is frequently brought up by the fishing lines from deep water off Aberdeen, and gives its size as nearly an inch and a half long, by an inch broad; 'dimensions,' as we are informed by the authors of the 'British Mollusca,' 'far above the average of English examples.' It would thus seem from its extreme scarcity in all its recorded localities, and its comparative abundance as well as its superior size on our own and on the Aberdeenshire shores, that the north-east coast of Scotland is the head quarters of this interesting bivalve."

Razor-case Solen, *Solen siliqua*. "Spout-fish."

Sabre-case Solen, *Solen ensis*.

Pellucid Solen, *Solen pellucidus*. "Moray Firth, in from thirteen to thirty-four fathoms (McAndrew)," *F. & H.* While fine specimens of the first of these three razor or spout-fishes may be picked up at all parts of the coast, even on the rough and high shingly beaches, a

fertile locality for all the three species will always be found on the sands that lie on the south-eastern shore of Lossiemouth bay. As "Mr. McAndrew dredged *Solecurtus candidus* in Zetland and off Caithness (but never alive)," it may be noticed here as one of those species that border upon, although not perhaps within, the limits assigned to this list.

Ferroese *Psammobia*, *Psammobia Ferroensis*. "Moray Firth (McAndrew)," *F. & H.* "Gamrie," *Mac.* Abundant along the Elginshire shore, exhibiting all its varieties in colour and size.

Small Tellina-like *Psammobia*, *Psammobia Tellinella*. One specimen, now placed in the Elgin Museum, was a few years ago found in the stomach of a fish killed in the Moray Firth. Burghead, *Mr. Murray*. Banffshire coast, *Edwards' collection*.

Thick Tellina, *Tellina crassa*. A specimen from the Moray Firth was in the possession of the late Alexander Robertson, Esq., Woodside. Another fine one, procured by Mr. Macdonald from the Buckie fishermen, has been placed in the Elgin Museum. A few single valves have also been found by Messrs. Duff and Martin. "Frazerburgh," *Macgillivray*. Banffshire coast, *Edwards' collection*.

Pomegranate Tellina, *Tellina balaustina*. "A single valve, attached to the byssus of a *Modiola vulgaris* brought up by the lines of a Buckie fisherman forty miles from the South shore of the Firth, is now in the Elgin Museum. It was apparently fresh, and measures three-fifths of an inch in length and half an inch in breadth," *Mr. Macdonald*.

Donax-like Tellina, *Tellina Donacina*. "Moray Firth coasts (McAndrew)," *F. & H.*

Dwarfish Tellina, *Tellina pygmæa*. About six single valves of this shell have been found in the Firth during 1853.

Thin-shelled Tellina, *Tellina tenuis*. Very abundant in different localities; as the sandy shores both at Lossiemouth and Burghead. "This pretty and well known species" forms no small element in the collection of the youthful amateur conchologist who spends his summer holidays at the sea-side.

Streaked-shelled Tellina, *Tellina fabula*. Not uncommon. Occasionally preyed upon by the haddock.

Little Thick Tellina, *Tellina solidula*, (*Psammobia Tellina*, Flem.) Frequently to be met with on the sandy shores.

Brown Tellina, *Tellina proxima*. In May, 1853, Mr. Martin discovered a complete specimen of this rather rare shell; and single

valves of it have been found at Lossiemouth both by him and Mr. Macdonald. Banff, *Edwards' collection*.

Iridescent *Syndosmya*, *Syndosmya prismatica*, (*Amphidesma prismatica*, Mac.) Dredged off Lossiemouth, and also in Burghead bay, by Mr. Macdonald. Not unfrequently seen as part of the multifarious contents of the haddock's stomach. Banffshire coast, *Edwards' collection*.

Lister's *Scrobicularia*, *Scrobicularia piperata*, (*Amphidesma compressa*, Flem., *Lutraria Listeri*, Mac.) Frequent, in a recently fossil state, in the bed of the now fresh-water loch of Spynie, Mr. Martin. It is the *Lutraria compressa*, noticed as occurring with many other sea-shells under a foot or two of sand in the old beds of the Loch of Spynie, in the excellent sketch of the Geology of the district, by the late Alexander Robertson, Esq., Woodside, in the Messrs. Anderson's 'Guide to the Highlands and Islands of Scotland,' edition printed in 1850.

Common or Oblong *Donax*, *Donax anatinus*, (*Donax trunculus*, Flem. and Mac.) "This extremely common shell," from its more durable texture and its bright colours and gloss, attracts the eye of even the less observant who saunter on the sea-beach.

Thick-shelled *Macra*, *Macra solida*. A fine specimen of this "common frequenter of most of our sandy shores all round Britain," is placed in the Elgin Museum by Patrick Duff, Esq., who found it on the shore at Stotfield. To show its great range as to depth when the soil is suitable, it is stated by Messrs. Forbes and Hanley, that "in one instance it was dredged from water as deep as thirty-five fathoms at a distance of fifteen miles from Duncansbay Head, (McAndrew)." *Macra truncata* has been found on both sides of the Moray Firth, although not within its limits, viz., at "Stronsa in Orkney," and "on the shores of the Firth of Forth," *F. & H.*

Elliptical *Macra*, *Macra elliptica*. Mr. Martin first discovered this as a Moray Firth species, and has placed a specimen in the Elgin Museum. Mr. Murray has also found it at Burghead; Mr. Macdonald has met with it on several occasions brought up by the fishermen's lines, and considers it by no means uncommon.

Subtruncated *Macra*, *Macra subtruncata*. "Dredged in fifteen fathoms, Moray Firth, (McAndrew)," *F. & H.* "Abundant in Burghead bay, also off Lossiemouth, August, 1852; probably equally so throughout the Firth, wherever the bottom is sandy," Mr. Macdonald.

Simpleton's Mactra, *Mactra stultorum*. Common, and, at some seasons after a north-east gale, very abundant on the shore, with many varieties as to colour and size.

Elliptical Lutraria, *Lutraria elliptica*. Abundant on the sands between Lossiemouth and Spey; also on the shore westward from Burghead. Among the fishermen of Stotfield and Lossiemouth it has got the same name as their brethren of Findhorn give to *Mya arenaria*, viz., "badgers." When thrown up, as it sometimes is (Zool. 3482) by a northern sea-storm, it is readily collected, and highly prized as bait for cod and haddock.

Decussated or Cross-lined Tapes, *Tapes decussata*, (*Venerupis decussata*, Flem. and Mac.) Valves of this species have been discovered by Mr. Martin in one of those singular collections of shells of the oyster and other edible mollusks which seem to have been made at a very early period, when the area of the Loch of Spynie, whence they have been gathered, was an arm of the sea. This species is also to be met with in single valves on the west side of Burghead towards Findhorn, April, 1853.

Pullet Rock Venus, *Tapes pullastra*, (*Venerupis pullastra*, Flem. and Mac., and *V. perforans*, also of Flem.) Common along the Elginshire shore. "Banff, both varieties," Mac.

Virgin Rock Venus, *Tapes virginea*, (*Venerupis virginea*, Flem. and Mac.) This is certainly one of our less common bivalves, but is by no means rare. It has been found all along the south coast, at least from Burghead to Peterhead. Mr. Macdonald justly remarks, that Messrs. Forbes and Hanley state "on the east coast of Scotland and north-east of England it is either very rare or absent, not occurring in the copious lists of Macgillivray or Alder;" and that this is evidently a mistake, as it does occur in Macgillivray, and the Moll. Abred. p. 269, is actually quoted in the list of synonymes attached to *T. virginea* in the 'British Mollusca.' A copy of Mr. Alder's excellent 'Catalogue,' most kindly presented by the author, shows that it (*Pullastra virginea*) is found "on most parts of the coast, but not common."

Thick-ridged Venus, *Venus casina* (and *V. reflexa* of Flem. and Mac.) Has been met with both by Mr. Martin and Mr. Macdonald, the latter of whom has presented a fine specimen to the Elgin Museum. Burghead, Mr. Murray. "Gamrie," Mac. Mr. T. Edwards has collected a few fine specimens of it at Banff.

Common or Hen Venus, *Venus striatula*, (*V. gallina*, Flem. and Mac., and *V. Prideauxiana*, Mac.) Frequent on all the sandy

shores. "Young specimens are occasionally found in the stomach of the but-horn (*Asterias aurantiaca*)," *Rev. Mr. Weir*, Lossiemouth. "Plentiful in the sandy bay of Burghead, where a cast of the dredge is sure to bring up alive this species, as well as *Donax trunculus*, *Psammobia Ferroensis*, *Solen pellucidus* and *S. ensis*, *Astarte compressa*, *Tellina tenuis*, and *Macra subtruncata*, with fine specimens of *Ophiura texturata* twisting his snaky arms among them; also, but more rarely, *Corbula nucleus*, *Tellina fabula*, *Syndosmya prismatica* and *Kellia suborbicularis*," *Mr. Macdonald*.

Banded Venus, *Venus fasciata*. Not common. A few specimens have been found by *Mr. Martin* and *Mr. Macdonald*; and it has also occurred at Burghead to *Mr. Murray*. "Frazerburgh," in the Moray Firth, is given among other localities for this species in *Macgillivray's 'Aberdeenshire Mollusca.'*

Ovate or Ribbed Venus, *Venus ovata*, (*Cytherea ovata*, *Flem.*) Not uncommon. *Mr. Macdonald* has dredged it both entire and in single valves. It has also been observed in single valves adhering to *Ascidia*, &c., and in the stomachs of fishes. "Often to be seen in boats just returned from sea," *Mr. Martin*. "Gamrie," *Macgillivray*.

Worn Artemis, *Artemis exoleta*, (*Cytherea exoleta*, *Flem.* and *Mac.*) Not common.

Glossed Artemis, *Artemis lincta*, (*Cytherea lincta*, *Flem.* and *Mac.*) "Moray Firth, fifteen fathoms (*McAndrew*)," *F. & H.* This species is common in this locality.

Waved Lucinopsis, *Lucinopsis undata*, (*Venus undata*, *Flem.*, *Cytherea undata*, *Mac.*) Occasionally met with; as at Lossiemouth, by *Mr. Duff*. "Gamrie," *Mac*.

Icelandic Cyprina, *Cyprina Islandica*. "Cow-shell." Common. A few years ago the sea, during a severe northern storm, broke in upon a bed of this species, and threw numbers of them ashore near Findhorn.

Triangular or Minute Circe, *Circe minima*, (*Cyprina minima*, *Flem.*, *Circe triangularis*, *Mac.*) *Mr. Macdonald* detected a single pretty fresh-looking valve of this species in the collection made at Banff by *Mr. Thomas Edwards*.

Scottish Astarte, *Astarte sulcata*, (*A. Scotica* and *Danmoniensis*, *Flem.*) "Has been taken in thirty-four fathoms in the Moray Firth," *F. & H.* Occasionally met with on the shore. "Dredged of Lossiemouth, August, 1852," *Mr. Macdonald*. "Gamrie," *Macgillivray*.

Elliptic *Astarte*, *Astarte elliptica*. Rather rare. A few specimens have been found by Mr. Martin in the neighbourhood of Lossiemouth.

Arctic *Astarte*, *Astarte arctica*, (*A. compressa*, Mac.) A single, and not very fresh-looking valve, brought up by the lines of a Buckie fisherman, probably from deep water, has been obtained, May, 1853, by Mr. Macdonald, and presented by him to the Elgin Museum.

Compressed many-ribbed *Astarte*, *Astarte compressa*, (*A. multicostrata*, Mac.) Common in many parts of the Firth. Mr. Macdonald found it plentifully in Burghead Bay, July, 1852; also off Lossiemouth in August of the same year, in twenty-five to thirty fathoms, along with *Venus ovata*, *Corbula nucleus*, *Artemis linctæ*, *Dentalium entalis*, *Macra solida*, *Leda caudata*, *Virgularia mirabilis*, *Tubularia indivisa*, and other inhabitants of sandy mud. Messrs. Forbes and Hanley state that it has been dredged in from eight to forty fathoms in the Moray Firth, by Robert McAndrew, Esq.

Triangular *Astarte*, *Astarte triangularis*, (*Goodalia triangularis* and *minutissima*, Flem. and Mac.) "In the Moray Firth, (McAndrew)," *F. & H.*

Prickly Cockle, *Cardium echinatum*. Very common in all the stages of growth, and so frequently found adhering to the lines, that Mr. Macdonald states that among the shells received by him, during the winter 1852-3, from Alexander Cowie, an intelligent fisherman of Buckie, there were examples of this species sufficient to stock the museums of a kingdom.

Common or eatable Cockle, *Cardium edule*. This well known shell is found scattered along the sandy parts of the shores of the Moray Firth; but the neighbourhood of Findhorn is the only spot on the Elginshire coast, where it occurs in such numbers as to be collected for sale during the months of spring. "The Murray Firth (McAndrew)," is given by Messrs. Forbes and Hanley as a habitat for variety "*rusticum*," (vol. ii. p. 19).

Knotted Cockle, *Cardium nodosum*. Frequent. Dredged by Mr. Macdonald, off Lossiemouth, in thirty fathoms, August, 1853.

Banded Cockle, *Cardium fasciatum*. This species, as well as *C. nodosum*, is occasionally to be met with in the stomachs of haddocks, and among shell-sand. The next species of the 'British Mollusca,' viz., *Cardium pygmæum*, (*C. exiguum*, Flem. and Mac.) has been found both in the Zetland and Aberdeen districts of the German Ocean, and may consequently be looked for in an intermediate area, viz., the Moray Firth.

Swedish Cockle, *Cardium Suecicum*. This rare and exquisite addition to our list was dredged alive in thirty-five fathoms, muddy bottom, eight miles off Lossiemouth, in June, 1853, by Mr. Macdonald.

Smooth or Norway Cockle, *Cardium Norvegicum*, (*C. lævigatum*, Flem. and Mac.) Single valves are often picked up on the shore, and entire specimens occasionally found on the fishermen's lines.

Northern or Wrinkled Lucina, *Lucina borealis*, (*L. radula*, Flem. and Mac.) Common. "Moray Firth, in from fifteen to thirty-four fathoms (McAndrew)," *F. & H.*

Spinous Lucina, *Lucina spinifera*, (*Myrtæa spinifera*, Flem.) Not common. Mr. Martin has found it at Lossiemouth, and Mr. Murray at Burghead. A few specimens have also been taken from the stomachs of fishes. "The Moray Firth, in thirty-four fathoms (McAndrew and E. F.)," *F. & H.*

Flexuous Lucina, *Lucina flexuosa*, (*Cryptodon flexuosa*, Mac.) Single valves not uncommon. Often forming part of the shelly tube of Terebella. "Scarborough" and "Zeland" being both localities given for *Lucina leucoma*, it may prove yet to be a denizen of the Moray Firth.

Rusty Montacuta, *Montacuta ferruginosa*, (also *M. oblonga*, Flem. and Mac. and *M. glabra*, Mac.) "Murray Firth (McAndrew)," *F. & H.* Found in shell-sand, and in the haddock. Burghead shore, April, 1853.

Bidentate or two-toothed Montacuta, *Montacuta bidentata*. From the stomachs of fish killed by the Lossiemouth fishermen; and common in shell-sand.

Substriated Montacuta, *Montacuta substriata*. A single specimen of this rare and minute shell was detected by Mr. Macdonald on the spines of *Spatangus purpureus*, which he had received from Buckie.

Suborbicular Kellia, *Kellia suborbicularis*. Not uncommon. "Peterhead," Mac. Burghead, Mr. Murray. Dredged in the Firth by Mr. Macdonald; and occasionally seen as part of the food of the haddock.

Red Kellia, *Kellia rubra*. Discovered in considerable abundance among small Mytili, on the rocks at Burghead, by Mr. Murray, January, 1852. Not unfrequent in shell-sand.

Horny or Yellowish Cycle, *Cyclas cornea*, (*C. flavescens*, Mac.) Order Pot, near Elgin, Patrick Duff, Esq. Marsh below the bank at

Lesmurdie cottage, *Mr. Martin*. Canal, on the farm of Inverlochty, *Mr. Macdonald*. The Loch of the Romach, *Mr. I. Shand*.

The perplexing genus *Pisidium* has abundant representatives in almost every pool and ditch of the district. A series of specimens, collected from different localities by *Mr. Macdonald*, were sent to *Mr. Hancock*, of Newcastle, who, with *Mr. Alder*, kindly took the trouble of examining them, and identified the following species as denizens of the Province of Moray.

Dwarf *Pisidium*, *Pisidium pusillum*. In a small marshy pool near Linksfield quarry, *Mr. Macdonald*.

Shining *Pisidium*, *Pisidium nitidum*. Abundant, and of large size in the Redmire Marsh, Pluscurden School-house; in the Loch of Rininver, *Mr. J. Shand*. In a small clear rivulet on the farm of Spynie; the Deer's Loch, Quarrywood; by the Rothes road, four miles from Elgin, *Mr. Macdonald*.

Beautiful *Pisidium*, *Pisidium pulchellum*, (also *P. Jenynsii*, Mac.) Among the many localities for this species and its varieties may be noticed:—Marsh below Lesmurdie cottage; ditches at Inverlochty; west end of the Loch of Spynie; Tyock; Blackburn; Rough Bog, Pluscarden; Loch of the Blairs, Altyre; and Burn of Kinloss.

Fresh-water Pearl Mussel, *Unio margaritiferus*, (*Alasmadon margaritiferus*, Flem. and Mac.) An early, and indeed as yet the only, known locality in the neighbourhood of Elgin for this once highly prized shell, is at a bend of the Lochty or Blackburn, near Allarburn, where it has been known to exist for many years. In several parts of the rivers Spey, Avon, and Donovan, it has been gathered for the sake of the pearls—few and far between—expected to be found within it. Lachlan Shaw, the historian of Moray, 1775, says, "in the river Spey there are pearl-shells, in which I have seen many ripe pearls of a fine water and great value." *Mr. Charles Grant*, schoolmaster of the parish of Aberlour, has collected and kindly communicated the information, that about eight or ten years ago, an individual from Inverness fished for pearls at Abernethy, on the Spey, but, after the toil of two weeks and the destruction of many a mussel, he is reported to have carried off no greater reward than six or seven, of what size or value is unknown, as he was so tenacious of his fancied treasure, that he refused to exhibit them to the inspection of any one. He found the shells in still pools having a muddy bottom; and the instrument of landing was a long pole, having a string with a noose attached to its end. He contrived to get the noose round the shells, and, tightening it with a sudden jerk, drew them ashore. *Mr. Grant*

adds, "In my fishing excursions I have frequently met with the shells, which are about four inches long by two broad, and of a dark gray colour outside; but I have no recollection of having ever seen one with a live fish. I strongly suspect that the flood of 1829 has destroyed great numbers of them, as their remains along the banks of the Spey are now less frequently to be met with than they were previous to that period. There is a traditional account of an English company having fished for them about sixty or seventy years ago; but the fishing turned out unsuccessful, and consequently was discontinued. I have never seen or heard of any historical report of this company."

Duck Mud-mussel, *Anadonta cygnea*. Occasional. Mostowie, 1827. Mr. Martin finds it in an old canal near Inch Broom; and Mr. Robertson, in a moss below Newton. Lochinvar and Inverlochty, Mr. Macdonald.

The Common Mussel, *Mytilus edulis*. This well known shell-fish is most abundant in a young state, or rather in a diminutive form, on all the rocks that lie between tide-marks; but few are found on the Elginshire shores of size sufficient to be bait for the fishermen's hook. This industrious and hardy race of people have at least once a year to go to the Tain or Cromarty Firths (and at times, even as far South as the Tay and the Forth) and dredge, each crew, a boatful, for which they pay from £5 to £8. At the bar opposite the town of Findhorn, there is a small bed of mussels, of a size fitted for bait, which is believed to be indigenous. The mussels that are imported by the fishermen are stored up in small squares, bounded by lines of large stones, in any sheltered spot near low-water mark, where neither the tidal or stormy currents nor the shifting sands can molest them. The mussel is seldom seen exposed for sale in the inland markets, and in the fishing villages its value is too great to be appropriated in any other way than as one of the best and most commonly used kinds of bait for the fishing-lines. Some of the larger gulls seem to feed freely on the small-sized mussels.

The Horse Mussel, *Modiola Modiolus*, (*M. vulgaris*, Flem., and *M. barbatus*, Mac.) One long known and extensive habitat for this large bivalve, lies in the Moray Firth, and has the following bearings, as communicated by a most intelligent, obliging, industrious, and deserving fisherman, Mr. James Scott, of Stotfield, who has been the means of making less adventurous observers acquainted with many of the rarer zoological treasures of the deep. "The scaup or horse-mussel bank lies by compass N.E. from Lossiemouth, and distant

about forty miles. When the bank is gained, the South Knock, or hill of Deskford, in Banffshire, is in a line with the Scar-naze or head of Port Knockie, also in the same county; and the North Knock, a hill in Sutherland or Caithness, but not seen until nearing the ground, is in a line with the town of Helmsdale, in Sutherlandshire. These more strictly are the bearings of the west end of the horse-mussel bank, which extends eastward some ten or twelve miles, until it terminates at a place known to fishermen as the 'Breadshell' ground; so called, on account of the shells there found in a decayed state, coloured or crumbling like bread. The breadth of the bank from North to South is about six miles, and the depth of water over it varies considerably, being in some places thirty or forty fathoms, and in others only sixteen. The east end is the shallower or nearest the surface, and from it the South Knock is seen on a line with Loggiehead, which is on the east side of the town of Cullen." The north-east coasts of Scotland are given as a locality for *Modiola phaseolina* of the 'History of British Mollusca,' but, so far as is known, it has not been identified as a species found in the Moray Firth.

Tumid-ribbed *Crenella*, *Crenella discors*. Common. "Among the roots of *Corallina officinalis*, at Burghead, July, 1852," Mr. Macdonald. Often found among shell-sand. Mr. Macdonald makes the following remark upon the nomenclature of this species. Although quoted by the authors of the 'British Mollusca,' as a synonym of their *C. nigra*, it is probable that the *Modiola discrepans* of Macgillivray (Moll. Abred. p. 288) refers in part at least to this species. "The large valve" and the "young individual from deep water," from which the description appears to have been taken, may certainly be referred to *C. nigra*; but it can scarcely be doubted that those "found in tufts of *Corallina officinalis*, growing in pools at the Cove," were *C. discors*.

Marbled *Crenella*, *Crenella marmorata*, (*Modiola discors*, Flem. and Mac.) Common. "Occasionally free, adhering by its byssus to shells, &c., but more frequently burrowing in the tough skin of *Ascidia sordida* and *A. intestinalis*. "From a single individual of the last-named, no fewer than five full-grown examples were taken on one occasion," Mr. Macdonald. This species has also been taken from *Botryllus Schlosseri*.

Black *Crenella* or Corduroy Mussel, *Crenella nigra*, (*Modiola discrepans*, Flem. and Mac.?) Occasional. Two half-grown specimens were found a few years ago at Stotfield. Mr. Macdonald has got several very fine specimens and a few valves from the Buckie fisher-

men; and he dredged a half-grown specimen alive in forty fathoms, off Lossiemouth, June, 1853.

Decussated or Cross-lined Crenella, *Crenella decussata*. Occasionally found in shell-sand, on the shelly cases of Terebella, &c., in the stomach of fish. "The Moray Firth" is given by Messrs. Forbes and Hanley, as one of its British habitats.

Common or Pearly Nucule, *Nucula nucleus*. "Common off Peterhead and Banff," Mac. This is all the record that can at present be given here for this shell, so abundant in other districts of Britain.

Shining Nucule, *Nucula nitida*. Has been found in several instances. "Moray Firth, in thirty-four fathoms, (McAndrew)," F. & H. Burghead, Mr. Murray. Dredged off Lossiemouth by Mr. Macdonald. It has been got from a fish killed in the Firth.

Thin Nucule, *Nucula tenuis*. "Alive in forty fathoms, fine sand, off the Ord Head, Caithness, associated with Virgulariæ, Solen pellucidus, Montacutæ, Lucina flexuosa, &c., (Thomas)," F. & H. Several specimens, now in the Elgin Museum, were taken from the stomach of a haddock. Mr. Robertson, of Woodside, also met with it in a similar locality. Dredged off Lossiemouth by Mr. Macdonald.

Tailed Leda, *Leda caudata*, (*Nucula minuta* and *rostrata*, Mac., and *N. minuta*, Flem.) Messrs. Duff and Macdonald have each obtained specimens of this shell from the Firth, and have sent them to the Elgin Museum. Arca tetragona being found at "Buchanness in thirty-five fathoms," and also at "Orkney," on the other side of the Moray Firth, will probably, by-and-by, form an addition to the present list.

Ribbed Pentuncle, *Pentunculus glycimeris*, (*P. pilosus*, Flem.) "Peterhead," Macgillivray. A few specimens have been obtained by Mr. Macdonald from Buckie fishermen.

Great Fan Mussel, *Pinna pectinata*, (*P. ingens*, Mac., *P. fragilis* and *papyracea*, Flem.) "Frazerburgh," Mac. Several fine specimens of this shell have of late years been got from the Firth; at Buckie, Lossiemouth, Hopeman, &c.

Luscomb's Rasp Scallop, *Lima Loscombii*. "Moray Firth, in thirty-four fathoms (McAndrew)." F. & H. A fragment of a shell, from a fish killed in the Firth, is placed in the Elgin Museum, Edwards' collection.

Variegated Scallop, *Pecten varius*. "Peterhead," Mac.

Dwarf Scallop, *Pecten pusio*, Common.

Striated Scallop, *Pecten striatus*. Rare. One found by Mr. Martin at Lossiemouth, in a boat just returned from sea.

Tiger-coloured Scallop, *Pecten tigrinus*, (*P. obsoletus*, Flem. and Mac.) Not rare. "Gamrie," Mac. Burghead, Mr. Murray. "Frequently brought up by the dredge from a shelly or muddy bottom," Mr. Macdonald. Several good specimens have been got from the stomachs of fish.

Laskey's smooth Scallop, *Pecten similis*. "Trouphead, in sixty fathoms, numerous and free (Thomas)," F. & H. One specimen on a dead shell, from Lossiemouth. Mr. Macdonald has obtained specimens at Lossiemouth and Buckie, Edwards' collection.

Clam-shell or Great Scallop, *Pecten maximus*. Not uncommon. To be met with in single valves on the shore, and in the fishermen's boats on their return from the fishing-grounds.

Common Scallop, *Pecten opercularis*. Abundant. The most common of the northern Pectens, and perhaps the most beautifully painted and varied coloured of the larger boreal shells.

Icelandic Scallop, *Pecten Islandicus*. "Gamrie," Mac. Single valves of this species have been found, but always in a semi-fossil state, at Lossiemouth by Mr. Martin, and at Burghead by Messrs. Macdonald and Murray.

The Common Oyster, *Ostrea edulis*. The only ascertained locality, in the district assigned to this list, where this, the most prized of all the British Mollusca, is now found alive, is in the Cromarty Firth, near Tarbet House. It is probable, however, that they have been planted there, as the bed is small and strictly preserved for the private use of the proprietor's family. Dead or semi-fossilized valves are frequently found along the southern shore of the Firth, where several attempts to plant a colony have failed, chiefly, it is believed, owing to the vast accumulations of shifting sands, which would not long leave unvisited by their submerging and destructive influence, every firm or tenacious muddy bottom where the oyster could flourish. At some early period, and that since the country was peopled, there must have been no lack of them, as the heaps of shells already referred to on the north-eastern skirts of the Loch of Spynie, prove. The whole area of its ancient and extensive bed is pervaded with their remains; and, had it still continued an arm of the sea, it certainly would have yielded, by ministering largely to many a modern "feast of shells," a revenue tenfold greater than that wide and brackish portion of it now does which lies unreclaimed,—the habitat of the Typha and Scirpus, the haunt of the mallard and the coot.

Saddle Scale Oyster, *Anomia ehippium*, (also *A. electrica*, *squamula*, *cepa*, *punctata*, *cylindracea*, *fornicata*, *tubularis*, &c. of authors). Very common. The variety *squamula* is very abundant in the interior of deserted shells; the variety *coronata* of Bean, with the edge serrated on one side, has been also met with by Mr. Macdonald.

Prickly Scale Oyster, *Anomia aculeata*, (also *A. striatula*, Flem. and Mac.) Common.

Patella-like Anomia, *Anomia patelliformis*, (*A. undulata*, Flem. and Mac.) Stotfield, *Robert McAndrew, Esq.* Mr. Macdonald observed it among shells collected by Mr. Thomas Edwards, at Banff, and obtained a valve which one of his pupils, Master C. H. Grant, had picked up in a Lossiemouth fishing-boat, March, 1854.

Striated Anomia, *Anomia striata*. Found among shells, sent from Buckie, by Mr. Macdonald, May, 1853.

Brachiopoda.

Anomalous or Shapeless Crania, *Crania anomala* (*Criopus anomalus*, Flem.) A few years ago Mr. Martin found a parcel of "this curious and interesting bivalve," on a stone brought in from deep water by the fishermen at Lossiemouth.

Pteropoda.

Fleming's Spiralis, *Spiralis Flemingii* (*Fusus retroversus*, Flem.) A single specimen of this minute shell, since unfortunately crushed, was discovered by Mr. Macdonald, among shell-sand, gathered on the shore at Burghead, in 1853.

GEORGE GORDON.

Birnie, by Elgin, April, 1854.

(To be continued).

Proceedings of Natural-History Collectors in Foreign Countries.

MR. H. W. BATES.*—"Santarem, August 18th, 1853.—By this time I hoped to have sent you a good collection from a new locality, but I have not yet been able to get a passage to Altar do Chão; it is a small village, with only a few idle Indians and a priest (a very good

* Communicated by Mr. S. Stevens.

fellow however), and there is consequently no communication except in small open Indian boats to the place. Two months ago I bargained with a young man, who has a canoe and Indians, to take me there after a journey he was about making to Obydos, but he has not yet arrived, and I have been kept in suspense from day to day for a whole month; I have now other chances of a passage, and have got all ready and hope to leave in a few days. The present collection is small, but I think there are a good many rare and new things. There is really splendid ground near this, but it is too far for effective constant working, six miles distant over a scorching, sandy desert; I have made twenty-seven excursions thither since Christmas, and my usual number is twenty new species every time. It is astonishing the number and variety of Coleoptera there; they run small, but a great many handsome Longicornes, Clerii, &c., unfortunately mostly unique specimens: of Ibidion alone I number eighteen species now, and thirty-seven species of Clerii, &c. I have not heard from you since yours of date the 26th of March; I am waiting replies to my long letters of March 10th and 29th, May 27th and June 27th,—March 10th and May 27th with collections; the former valued at £34, the latter at £35. I expect parcels of papers, magazines, entomological notes and books, which would be a great treat to me now, as I have been long without receipt of any; I certainly could not exist in these deserts without such things. The steamer from Pará to Barra Rio Nigro runs regularly, but the other line from Barra to the Ucayali has not yet arrived, they are delaying it now too much, as the Upper Amazons will be, at its lowest mark of water, very inconvenient for a first voyage, as they will have to stop incessantly to take soundings ahead to find the channel. I hope the great number of small Coleoptera I have sent in these last three collections will be considered good, as I find them very curious and interesting, and that they will all sell. Mr. Hewitson will be impatient at the long neglect of Diurnes, there are very few or none at Santarem in comparison with the other districts. I have written so many letters since the date of your last, that I find I have very little to say now.

“I forward you a few illustrations of Botany, all I could get complete. I have a number of odd things yet, and a still greater number on my list to look after, but it is very awkward work; as to those sent, the accompanying notes will explain. Remember me kindly to all friends; I am looking anxiously for copious answers from them to my notes sent, and for this reason I send very few now.”

"Santarem, December 17th, 1853. — I now forward the collection of insects I have made up the River Tapajos, entirely at the Indian village called "Altar do Chão:" I have not had time to prepare the whole of the miscellaneous orders, but the Lepidoptera are complete. I left Santarem a few days after I last wrote to you, as I then told you I should. We departed on the 26th of August, at 7 P.M., and arrived at our destination at 11 A.M. the next day; the place is one of the most wretched, starved, ruinous villages that could be found on the earth, although so near a civilized place, but the situation is one of the most lovely spots that Nature has marked out, — a deep bay, belt of snowy sandy beach, towering pyramidal hills, wooded ridges, and what is of more consequence to me, such intermingling virgin forest stretching inwards towards the untrodden central deserts. There is no communication between this and Santarem except in little Indian boats. I was set down there as a favour by an Itainba tradesman. It would have been easier for me to have gone straight on to Itaiuba, about 100 or 200 miles beyond my last trip, but I declined it, after making minute inquiries as to the nature of the country; it is chiefly dry, sandy campo, with no virgin forest near, a style of country which I well know will not repay investigation, and such is nearly the whole of the borders of the River Tapajos; the best part of my collection last year not being made on the main river, but in the branch river Cupari. I worked the forests of Altar do Chão very closely, losing very few days from bad weather, from the 27th of August to the 30th of November, on which day I returned to Santarem. You will find many of the handsomest of the new species of last year, and some very remarkable and new things, good series of specimens, indeed I consider the Lepidoptera to be very fine; I took altogether about thirty-five new species of Diurnes, nearly as many as I took at Egá in the first three months, but how different are the species from the Egá ones! Even some genera and families which abound most in Egá have few representatives here, or none; it is strange that during the whole time I saw not half-a-dozen specimens of Papilio; Heliconias are almost wholly absent; Ithomia not a single specimen! nor Leptalis, even the common Leptalis vocula I could not find. The genera Eresia, Cybdelis, Catagramma, and many others also not found, and the Nymphalidæ, all very rare. In the Coleoptera, you will see a great number of new species, though small; the astonishing number of Iridions in the Longicornes is particularly notable. I do not send any notes this time, and the contents of the boxes remain just as I placed them in the first instance

from the store-boxes; but I have paired a fair number of species of butterflies, some have very strange and unexpected mates, and I have no doubt will astonish Mr. Hewitson and other friends, particularly the *Lemonias Pythia* and another species, the *Diophthalma Crœsus* (shining blue *Mesosemia*), which is the male, the female being of the plain *Mesosemia* pattern, and of course the generic name *Diophthalma* is of no utility; of the large series of species of the beautiful genus of *Erycinidæ* (speckled colours) I have mated I think the whole. I have examined all my species at present in hand here (222 species, the great majority mated); dissected a great quantity of specimens; found some laws in the variation of their neurulation, &c.; but I am obliged in grouping the genera to be content without the names.

"I duly received your kind letters of May 24th and August 27th, and also the two numbers of 'Illustrated News,' *viâ* Pernambuco (free of postage); I am happy to say also that I received the second box of books, and that accompanying your letter of August 27th quite correct, with a box of water-colours, &c.; the former parcel, sent May 28th, I shall now write for to Parà, the Parà house corresponds with me punctually, and I have no doubt the miscarriage of parcels is the fault of the Liverpool house, who do not put them in the manifest.

"I intend to rest here a little, and then go to Villa Nova until the good season for Egá comes, but I intend going some hundreds of miles beyond Egá; the steamer made a very clear voyage to Nauta and back, but the second and finest steamer has got fast on a rock near Villa Nova; I doubt if it will not be a complete wreck. As regards a set of showy butterflies, I know pretty well now what suits and will soon send you a few. Schiödt's new *Staphylini* interest me much; I think I shall be sure to find them, and as soon as I get this collection off, I will go after them. Kind regards to all friends.

"H. W. BATES."

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

April 3, 1854.—W. W. SAUNDERS, Esq., Vice-President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for April; by the Editor. The 'Athenæum' for

March; by the Editor. The 'Literary Gazette' for March; by the Editor. The 'Journal of the Society of Arts' for March; by the Society. 'Proceedings of the Royal Society,' Vol. vi., No. 100; by the Society. 'Revue et Magasin de Zoologie,' 1853, Nos. 11 & 12, 1854, Nos. 1 & 2; by the Editor, M. Guérin-Ménéville. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1852, Nos. 2, 3, 4, 1853, Nos. 1, 2: by the Society. 'Hewitson's Exotic Butterflies,' Part 10; by W. W. Saunders, Esq. 'The Entomologist's Companion,' Second Edition, by H. T. Stainton: by the Author. A box of Lepidoptera from Bogota; by T. J. Stevens, Esq., Corr. M.E.S. Various Insects of Ceylon; by G. R. H. Thwaites, Esq., M.E.S.

Election of Members.

T. Tapping, Esq., 43, Gloucester Place, Kentish Town, and the Rev. D. F. Jarman, Manor House, Hadley, Herts, were elected Members of the Society.

Exhibitions.

Mr. Douglas exhibited *Depressaria Capreolella*, taken flying in the sunshine, on Sanderstead Downs, on the 12th of March; also a larva of *Elachista Megerlella* mining in the grass, *Bromus* asper.

The Rev. Joseph Greene sent for exhibition a specimen of *Stauropus Fagi*, ♀, bred from a larva taken at Halton, Bucks, and a specimen of the very rare *Gluphisia crenata*, reared from a larva found on a poplar near Halton, on the 18th of August. "The larva was about an inch in length, depressed, tapering somewhat at each end; the colour grass-green; on the first segment a square brick-red spot, four more on the intermediate segments, and one also on the last. It formed a cocoon on the same day on which I found it. In reference to the early appearance of these insects, I should mention that they were kept in a green-house."

Mr. Baly exhibited a quantity of Hymenoptera, captured by Signor Botteri, in Dalmatia, comprising several species of *Magachile*, *Nomada*, *Eucera*, *Anthophora*, *Anthidium*, *Ceratina*, &c.

Mr. Stevens exhibited some insects recently captured by Mr. Bates, at Santarem, including twelve new Longicorn beetles; and among the Lepidoptera several *Erycinidæ*, remarkable for the difference of colouring in the sexes, which had hitherto not only been taken to be distinct species, but had even been placed in different genera. Mr. Bates had informed him that he had discovered a character in the neuuration of the wings of this family, which he intended to communicate to the Society at a future period. Mr. Stevens also exhibited two new insects, sent overland by Mr. Fortune, from China,—a *Carabus*, and the female of *Dicranocephala Wallichii*, being the second known specimen in Europe. He also exhibited some insects just received from Mr. Thwaites, in Ceylon, an *Adolias* and one of the *Arctiidæ*, with their very singular larvæ, the latter with foliaceous appendages.

Ants destructive to Cocci.

Mr. Spence communicated the following extract of a letter from G. H. K. Thwaites, Esq., F.L.S., Corr. M.E.S., dated Peradenia, Ceylon, February 9, 1854.

"A gentleman in this island has at length discovered a remedy for the bug which attacks the coffee-plant, but it seems rather uncertain at present whether the remedy be not really worse than the disease. Armies of red ants have been called in, and it appears that they make sad havoc amongst the young *Cocci*, but it is very certain that

if the ants remain in any numbers upon the coffee-bushes, the Coolies would be unable to gather in the berries, for these said red ants bite most fiercely, and the natives have a great dread of getting amongst them. The ants seem to devour the young Cocci, but on opening their nests, I have found many of the larger full-grown Cocci, which I fancy they use as cows, like other ants, the smaller species of which are always attached to where the Coccus abounds, and feed on the exudation from them. If the ants can be induced to quit when the Coccus is destroyed, they will be a useful acquisition to the coffee-planter, but if they persist in remaining in the bushes, I do not know how pruning and gathering can be accomplished on the estate, but this will be ascertained by-and-by. I question whether the ant would live on the higher estates, as it is only found at a moderate elevation. It is very abundant here, and makes its large nests in cinnamon and other trees, spinning together the leaves at the end of a bough, and woe be to him who breaks into their dwelling. A Cooly who has happened to do so in climbing a tree, comes down a great deal faster than he went up. Botany occupies so much of my time, that I am quite unable to devote particular attention to Entomology or any other branch of Zoology, and I often wish each day was double its length. This is such a fine field for a critical examination of tropical plants; and the field is so extensive that I see no prospect of finding my work slacken in that direction. Mr. Edgar Layard, who is now in England, is our most enthusiastic zoologist, and I shall be glad when he returns to the island."

Mr. Westwood doubted if the ants intentionally destroyed the Cocci, considering their death as the accidental result of the injuries sustained in consequence of the endeavours of the ants to procure their exudation.

Method of capturing Bolbocerus mobilicornis.

Mr. Douglas read the following translation of a note on a method of taking *Bolbocerus mobilicornis*, communicated by M. A. Rouget to Dr. Aubé, and by him to the Société Entomologique de France, and inserted in the 'Bulletin' of that Society for 1853, page 25.

"The locality where I take *Bolbocerus mobilicornis* is about three kilom. from Dijon, in the centre of corn-fields and natural and artificial meadows, rather lower than the surrounding country, which, however, itself is flat. This locality is very damp, and is on the border of a small stream, which is nearly dry in summer, but where, on the hottest and driest nights, the dew is very abundant; it is at the edge of a field of lucern near this stream that I place myself in ambuscade in order to capture my insect. I station myself upon a road which is rather lower than the field, and thus, by stooping a little, I have my western horizon just above the stems of the lucern; this circumstance is indispensable for success, for it is between 8 and 9 o'clock that I find the insect flying heavily over the lucern, and if it be not projected upon the sky, it is impossible to see it on account of the obscurity. I do not know if the lucern is indispensable to the insect, and as the neighbouring fields have not the same elevation above the road, I have not been able to prove the matter; possibly the question might be resolved by means of a lantern, but not having tried the method, I do not know if it would succeed.

"To ensure a successful result it is necessary, independently of the condition of horizon, but for the same reason, to have a sky without clouds, and an atmosphere very

hot and calm, without which the insect does not fly; when the weather is favourable, I take in half an hour four or five specimens of *Bolbocerus mobilicornis*, but more females than males. I have remarked that those taken at the end of May are the yellow and brown varieties, which are only insects incompletely developed, those which I have taken in June and July are all black on the upper surface.

"I do not know any method of capturing the *Bolbocerus* in the day-time; there ought to be one, for the insect is then in the ground, as I have observed that living insects which I had brought home, and which remained all day buried in the earth at the bottom of a pot containing about four inches of it, every night came out, but in the morning I found they had gone in again; each day making fresh holes. M. le Major d'Anmont has told me he has often taken *Bolbocerus mobilicornis* near Lyon, on the banks of the Rhone, by digging into the holes made by these insects; he has also taken *Bolbocerus Gallicus*, near Marseilles, in the same manner. For my part, I have not noticed the holes of *Bolbocerus mobilicornis* in the locality where I take the insect, probably because the soil is not sufficiently damp and clayey to preserve their form; I have not observed any such holes as those made by them in captivity, but I think that with a little patience I might discover them."

Mr. Curtis remarked that many years ago he saw a number of these beetles flying at dusk over a heath near Norwich.

Mr. Stevens said he once caught one flying in a room at the Bull Inn, Birch Wood, attracted, he thought, by a light burning therein.

The following memoirs were read:—

New Species of Saccophora, &c.

"Description of a New Species of *Saccophora*, found in the valley of the Amazon by Mr. Bates, and proposed to be named in honour of him, *Saccophora Batesii*." By Edward Newman, Esq., F.L.S., &c., President. This paper contained a reference to the only other known species of the genus described by Dr. Harris, under the name of *Melsheimeri*, and critical observations on both species, the larvæ of which, in their sack-like coverings and general habit, so much resemble the *Psychidæ*, while in their perfect state they appear to belong to the true *Bombycidæ*.

Mr. Westwood thought that these insects well showed that because the larvæ of different species resembled each other in form and habit, the perfect insects were not necessarily of the same genus or family; for here was an insect whose larva was a case-bearer, like the *Psychidæ*, and yet the imago, especially the female, and this sex was always more normal than the male, was winged in both sexes, and was allied to *Odonestis*; and further, he considered that M. Bruand and other French entomologists were in error, in associating *Talæporia* and such case-bearing *Tinæ* with the *Psychidæ*.

"Descriptions of some New Species of *Lucanidæ*, taken in the North of China, by Mr. R. Fortune:" by W. W. Saunders, Esq., F.L.S., &c.

"Descriptions of the Larvæ of some Coleopterous Insects:" by John Curtis, Esq., F.L.S., &c.

All these papers were illustrated by drawings of the several subjects.

A new part of the 'Transactions,' completing Vol. ii., New Series, was announced as ready.—J. W. D.

The Corby Crows and the Rooks. BY W. H. SLANEY, ESQ.

THAT "the times are out of joint" few can deny ; and from what I am about to relate, it would appear that the aggressive and belligerent spirit put forth by His Imperial Majesty of Russia, which is now "frightening the world from its propriety," is not alone confined to the human race, but has extended itself, to some at least of the feathered creation as well.

At a short distance, and on the opposite side of a small valley from whence this is written, a large rookery has been established time out of mind ; but as the Malthusian doctrine had no influence on the system adopted amongst the rooks, and as they never considered whether the supply of trees to build nests in equalled the demand, the number of nests and young rooks increased so fast, as to render it absolutely necessary that fresh colonies should be established in the neighbourhood ; and the original rookery, which was of large extent, sent off detachments from time to time to adjacent places, and amongst others, some high ash-trees, growing out of a pit at the corner of a meadow near the house, were selected as a favourite residence for one of these detachments, which, in a few years, increased and multiplied into a respectable rookery itself, containing from fifty to sixty nests. In this peaceful retirement the rooks have continued to live in harmony and quiet for some twelve or fifteen years, save and except that annually, about the beginning of June, an attack is regularly made upon the rooklings by the butler, groom, and gamekeeper, for the sake of the excellent pigeon-pies they are supposed to be capable of being converted into. But this disturbance of their juvenile felicity is not permitted simply for the sake of saying of them, as the old song said of the "four-and-twenty blackbirds baked in a pie," that it was "a dainty dish to set before a king," but because the numbers increased so fast, that the farmers complained of the injury done to their crops ; and hence it became necessary to have a certain number from six to eight dozen, killed, in order to satisfy these seldom-contented agriculturists, and to save the whole colony from being decried : for farmers, while they admit that rooks do much good, yet are always inclined to condemn them when they do a little occasional harm. Many were the young rooks who, inheriting the craft and cunning of their parents, set at nought all the manœuvres of the butler and his assistants, and when scared away by the sounds of the early evening guns (not bells), betook themselves to the protection of

some large elm and fir-trees almost overhanging the house, and in which two or three pairs of aristocratic rooks, despising the common herd, had established their nests, looking down on the more immediate domain, which they considered doubtless as the Court end of the town, and exclusively belonging to themselves. Hither came the young fly-aways, and remained in safety until, in the progress of time, it became their turn to mate and return to the ash-tree coppice for the purpose of nidification. This happy system continued year after year with no interruption, except for the few days during the pie-making season before mentioned.

Towards the latter end of the autumn, as is the custom with rooks, they pay a visit to the rookery, just to look over the premises and see that all is in a proper state for early reparation when the pressure of circumstances in the ensuing spring requires such matters to be immediately attended to. As usual, in the beginning of the month of March last, many rooks came to the ash coppice in the corner of the meadow, and began repairing their nests, stealing materials from those of their friends and relations, unless most vigilantly watched by their respective owners; and thus proceeded matters for some short time, until the better part of four or five nests were partially completed and many others begun, when suddenly a stop was put to all further industry on the part of the more diligent rooks, and their operations abandoned; and in the same proportion as the nests ceased to be built and renewed in this favourite spot, they increased in the original rookery on the other side of the valley, and also in the place where the Court end of the town was supposed to exist, until, in the latter place the nests, from two or three originally built there, have now increased to sixteen, with a likely prospect of a further addition. But why this sudden change and abandonment of the former locality, a proceeding so unusual in rooks? Some powerful and overwhelming cause must have arisen, but what occasioned it seemed a mystery, until it was discovered that a couple of carrion crows had, after the device of the Emperor of all the Russias, seized upon the rooks' provinces, and expelled them from their long-previously occupied dominions. At first, the rooks objected to this intrusion of their two sable enemies, and refused to quit; but the loud, sepulchral, and warning voice of the crows bade them beware, and forthwith give place to these usurpers. Frightened at such threats and fearful denunciations, the rooks gave up and left the foreigners in possession of their much-loved home; and whenever a rook, thinking the coast might be clear, ventured to return to the half-finished nests, one or

other of the two corbies was sure to meet him, and again with dismal death-denoting croaks drove him away. Occasionally, however, the rooks would alight in some tree a short distance off, waiting to ascertain the result of these strange proceedings; but no sooner were they perched, than out sallied one of the crows, croaking and wailing at the poor affrighted rooks, till they were glad to escape the harrowing sound and decamp to one of the neighbouring rookeries, there to report the lamentable fate which had befallen the ancient and respected dynasty of rooks. Occasionally, too, a few jackdaws would alight in the ash-trees, curious as is their nature, to know what was astir; but no sooner had they commenced their pert, inquisitive note, than out flew the corbies and scared them away, taking them, no doubt, for some friendly European power come to assist the poor Turks; and away went jackdaw in a more hasty manner, than, it is sincerely to be hoped, any allied power of the Turks will ever do from the Russians. This forcible possession continued until the rooks had entirely given up all hope of recovering their lawful home; and with many bitter regrets and loud demonstrations of feeling at this most Russian-like attack on their rights, they ceased further to visit their old haunts.

Having thoroughly convinced myself, after several mornings' and evenings' careful watchings of the proceedings going on, what was the real state of the case, I thought it became me no longer to allow of this aggression on the part of the carrion crows, for whom, under no circumstances, have I any sympathy, knowing the great damage they do in various ways to young lambs, game, eggs, &c., I therefore volunteered an alliance with the persecuted rooks. For this purpose, I desired the keeper to go early and late, and secrete himself under the ash-trees in the pit where the two crows had now taken up their abode, and to shoot them as speedily as possible. For several mornings at 4 o'clock, and again late in the evenings, the keeper waited in vain, the two crows always keeping just out of reach; till at length, one unhappy crow coming somewhat nearer, the keeper shot at it, and declared, though it did not absolutely fall dead, he was certain he must have killed it, because it flew straight up as if it were going into the clouds, and he could see nothing more of it. The companion crow was too wary to let the keeper try the same experiment upon him, and kept aloof for two or three days, when again a pair were seen and heard croaking at every passing rook, as before. The keeper tried all means to circumvent the corbies, but could only report his own failure and consequent vexation: but unwilling to be

outwitted by a crow, he bethought him of fastening down near to the coppice a live cat secured to a peg, and watch the crows' approach ; having done this, and placed himself in a convenient ambush, one of the crows espying the cat, and thinking it was there for no friendly purpose, began cawing and hovering over it, and giving the poor animal timely warning that if it did not forthwith decamp, it would very shortly be converted into crows' meat, and its skin probably be made to serve as a lining for the young crows' nest. Poor puss only replied by a few pensive mewings, when the angry crow made a nearer swoop, and thereupon off went the keeper's gun, killing the crow, and relieving the cat from further apprehension. Again was the same plan tried with the other crow, but in vain ; but there being a necessity that the crow should be killed, and necessity being the mother of invention, the keeper having the night before caught seven or eight large rats in his rabbit-traps, placed some of them within sight of the crow, together with a large male ferret, pinned down in the cat's place, thinking that the curious appearance and strange chattering noise of the latter, when it found it could not get at the dead rats, purposely placed a little way off it, would probably attract the crow's attention. This proved successful, and the crow was soon shot, but not before another crow was caught in a steel trap baited with egg-shells, and placed on the top of a cropped hedge close by ; and this last crow, supposing the keeper to be really correct in having killed the first he shot at, would then make up two pair of carrion crows which had alone, in the short space of a week or ten days, driven away from their previously long-established and constantly occupied rookery, not less than from 150 to 200 rooks, a circumstance which I am not aware has been noticed as occurring before.

I should add that within a very few days of the last of the crows being destroyed, some few pairs of rooks returned again, and recommenced building their nests ; but this Russian invasion has so depopulated the province that there are now only to be seen four or five nests, where before there were fifty or sixty, and it will take a long time probably before the rooks gain sufficient confidence to return as formerly to the ash coppice.

WILLIAM HENRY SLANEY.

Hatton Hall, April 20, 1854.

Anecdote of an Eagle.—I beg to forward for insertion in the 'Zoologist' the following curious anecdote, which has been kindly extracted and translated for me, from a Danish newspaper (the 'Fædrelandet') of the date of April 29th, 1854:—"A singular circumstance lately occurred at the village of Waäb, in South Schleswig. At noon-day a servant-maid was standing at Doctor Dittmann's window, with the youngest child in her arms, when suddenly down came a large bird of prey against the window, smashed it in, and fell motionless on the floor. The Doctor, who happened to be in the room, saw his guest was a dangerous one, namely, an eagle of some species, and twisted his neck for him before he came to his senses. The savage bird, probably, meant to have made prey of the child."—J. H. Gurney; Easton, Norfolk, May 8, 1854.

Note on the Difference of Weight between the Male and Female of the common Sparrow-Hawk.—A male and female sparrow-hawk were brought to me together a few days since, and it occurred to me that it would be interesting to ascertain the comparative weight of the two sexes: that of the male proved to be 5 oz., while that of the female was $10\frac{1}{2}$ oz., being more than twice the weight of her partner; so great a difference (though probably not more than usual) is yet, perhaps, worth recording.—Id.

Note on the Cuckoo carrying its Eggs in its Mouth.—In the Rev. A. C. Smith's interesting paper (Zool. 4286) "On the manner in which parent birds occasionally remove their eggs and young," that gentleman refers to the Klaas' cuckoo of South Africa, carrying its egg in its mouth, and very naturally infers from analogy, that our common cuckoo may do the same. In proof that such is the fact, allow me to refer to the 'Zoologist,' (Zool. 3145), where a case in point was recorded by Mr. J. O. Harper.—Id.

Occurrence of the Hoopoe at Chichester and Barnes Common.—I am indebted to Mr. Cooper, of 28, Radnor Street, St. Luke's, for the sight of two hoopoes, in the flesh; the first, a female, shot at Chichester, on the 24th of April; its crop contained several Aphodii and the small larvæ of Lepidopterous insects: the second was shot on the 28th of April by a friend of Mr. Atkinson, of Queen Street, Hammersmith.—Edward Newman.

Occurrence of the Golden Oriole at Godalming.—When riding in a gig by Ockford Pond, on the 10th of April, and looking out for swallows, I was delighted to see a fine male golden oriole pass over my head: although I did not see him settle, there could be no mistake, as the sun shone brightly on his black wings and golden-yellow body.—Waring Kidd; Ockford Road, Godalming, April 30, 1854.

Occurrence of the Lesser Spotted Woodpecker (Picus minor), at Turnham Green.—A man, of whom I am in the habit of buying birds, brought me on Saturday last, April 15th, a female specimen of the lesser spotted woodpecker, and to-day he brought the male, which he shot at about the same spot as the other. According to the Rev. F. O. Morris's splendid coloured work on British birds, they are considered rare, but that they sometimes occur in Middlesex. They are pretty little creatures, only weighing about 5 drachms, and measuring $5\frac{1}{2}$ to 6 inches.—John Dutton; St. Peter's Place, Hammersmith, April 19th, 1854.

Occurrence of the Crossbill near Scarborough.—We have had several of those singular birds, the common crossbill (*Loxia curvirostra*), shot lately in our neighbourhood; four of them came to me, one male and three females: the male was a very beautiful

one, and the bill turned opposite to those of the females. — *Alfred Roberts; King Street, Scarborough, March 10, 1854.*

Castings ejected by Rooks.—On the 17th of April, 1854, while standing beneath the trees in a rookery, I noticed a considerable quantity of matter on the ground round the trunks of the trees, looking very much like dried horse-dung. On examining it closely, I found that it consisted of oval pellets (some entire and some broken) of yellowish matter, which had evidently been ejected from the stomachs of the rooks; castings as they are called. On looking at the materials composing them through a lens, they seemed to consist principally of hard and indigestible vegetable matter, mixed with pieces of the elytra of beetles and small stones. The circumstance which I have here related may be a common one, and rooks may regularly be in the habit of rejecting the indigestible portions of their food, but the fact is new to me, and I cannot find it recorded in any of the works on Ornithology which I have had an opportunity of consulting. It is well known that most birds of prey throw up feathers and bones in the form of castings, and Mr. Yarrell says also, that this habit "is common to the shrikes, the swallows, and most of the insectivorous birds which feed on Coleoptera,"* but he does not say that the rook possesses it. Larvæ, worms, and other kinds of soft animal food, being the favourite diet of these birds, is it not probable that the rook may only possess this habit at seasons like the present, when the weather having been exceedingly dry for some time, it is obliged to live chiefly on grain and other vegetable food? In his 'Observations on Natural History,' the Rev. Leonard Jenyns makes this remark, when speaking of jackdaws building their nests in chimneys, "From the quantity of horse-dung which occasionally falls into the grates beneath where they are at work, I should suppose that they employ this material in some way, perhaps as a lining for their nests," (p. 153). With great diffidence I venture to throw a doubt upon the statement of so accomplished a naturalist and accurate an observer, but might not the apparent horse-dung have consisted of castings thrown up by the jackdaws? for the castings of the rooks bore so close a resemblance at a little distance to that substance, that at first I mistook them for it. Mr. Jenyns says, in another observation (dated April 27th, 1828), "A farmer in this neighbourhood observes that, for about a month at this period of the year, his corn-stacks are more resorted to and attacked by the jackdaws than at any other time, and that he is obliged to employ a boy to keep them off. This circumstance one would suppose must have some connexion with the breeding-season." Rooks may have the same propensity at that season as jackdaws, and the stomachs of both these birds being perhaps unprovided with a gizzard strong enough to grind down the husks and other hard parts of the corn, they may reject them in castings.—*R. H. Meade; Bradford, Yorkshire, April 28, 1854.*

[See Hewitson's 'Oology,' i. p. 185, where the same fact is recorded, and a reference made to a prior record in Loudon's 'Magazine of Natural History.' It may be further observed that Mr. Hewitson attributes the circumstance to the same cause as Mr. Meade, namely, the unusual dryness of the weather preventing the birds from obtaining their usual food.—*E. N.*]

Curious Anecdote of Partridges.—Last spring, according to our usual practice, we

hatched a nest of partridges' eggs under a hen, and brought the young birds up in our garden. They exhibited a remarkable degree of tameness and familiarity. Though they would not exactly feed out of our hands, they would allow us to sit by them while feeding, with our hands within an inch of them scattering the corn before them; and whenever my wife, who took the chief interest in attending to them, went into the garden, they would come at her call from any spot where they might be, and it was amusing to see them follow her closely as she walked backwards and forwards about the lawn, and they would never leave her so long as she remained in the garden. The room we usually occupy has three windows in a bow, the middle one shuts down to the ground: the birds would come to this window, and if they were not noticed, would tap on the glass to attract attention, and as soon as they were observed, would run round to one of the side windows, from which they were usually fed, and fly upon the window-sill. As the season advanced, several of them strayed away and found other associates up the hill, but four remained constant quite into the month of August, and seemed to get more and more familiar, till one day these likewise disappeared, and seeing nothing of them for a day and a half, we supposed they would return no more. But in the afternoon of the second day, a tapping was heard at the window, and there were the four partridges again; when my wife rose from her chair they ran round to the accustomed window, flew upon the sill, and when she threw up the sash, they flew up to her and fluttered about her face and breast in a most surprising manner, then alighting on the ground, pecked up a few grains of corn which she threw to them, and flew away. Their action was so remarkable that it was impossible to fail being struck with it. Why did these birds come back after a day and a half's absence? Certainly not for food, for they did not peck up a dozen grains; they tapped to obtain notice, and when the window was opened by their kind friend and protector, they fluttered about her face and breast for a few moments and then flew away. It seemed as if they came for no other purpose, and intended by this extraordinary action, and in such dumb show, to take a parting salute and bid farewell. It was just as expressive, and as though they would have said, "We no longer need your care and kind attention; the time has come when we must follow the law of our nature and join our associates and kindred, but we have obtained leave to return once more to thank you for all your care and affection for us when we were motherless and helpless, and to give you one farewell salute." They returned no more.—*J. F. Dawson; The Woodlands, Bedford, April, 1854.*

Occurrence of Rare Birds at Scarborough.—I here send you word of the rare birds which have been killed on our coast last month, and which are in my possession. The red-necked phalarope (*Phalaropus hyperboreus*), in mature winter plumage, shot on the North Sands; the common skua (*Lestris catarractes*), mature; the glaucous gull (*Larus glaucus*), mature; the velvet scoter (*Anas fusca*), male and fully adult, found on the beach dead; the black redstart (*Phœnicura Tithys*), a male, shot at Filey; the snow bunting (*Emberiza glacialis*); the mountain finch (*Fringilla montifringilla*); the rough-legged buzzard (*Buteo lagopus*): all these rare birds are in first-rate feather.—*Alfred Roberts; King Street, Scarborough, January 5, 1854.*

*List of Land and Fresh-water Mollusks found near Sevenoaks,
Kent.* By R. H. S. SMITH, Esq.

As several local lists of land and fresh-water Mollusca have from time to time appeared in the 'Zoologist,' and have been examined with much interest by many others as well as myself, I have frequently wished to offer my contribution to this interesting department of Natural History. But the unwillingness, which collectors will understand, to publish a list before sufficient efforts had been made to render it complete, has hitherto delayed me, and even now, although the number of species is considerable, I expect future researches to be well rewarded.

A glance may be permitted at the geological character of the district to which my list refers, — always a matter of interest to the collector of inland Mollusca. It lies partly upon the southern aspect of the lower chalk formation, where it unites with the weald clay; and thus presents chalk, chalk-marl, green sand, ironstone, plastic, and other clays: but, owing to the dry nature of much of the soil, many of our Mollusca are but thinly represented. The small river Darent is distant about two miles, and, with the ditches near it, has afforded several species. A few have been obtained from a wider range. The nomenclature is that of Gray's edition of 'Turton's Manual.'

Bithinia tentaculata. Frequent in ditches near the Darent.

„ *ventricosa.* The Medway, near Maidstone.

Valvata piscinalis. The Darent and ditches near it; not abundant.

„ *cristata.* Same localities; rare.

Arion ater. Common, exhibiting the usual varieties of size and colour.

„ *hortensis.* Not so frequent as the last.

Limax maximus. Not uncommon.

„ *agrestis.* Common.

Vitrina pellucida. Frequent. I have one specimen considerably larger than ordinary, not transparent, and exhibiting a pearly lustre within.

Helix aspersa. Abundant.

„ *hortensis.* Abundant. Varying much in colour and markings, yet preserving the distinctions which seem to separate it from

H. nemoralis ; although the opinion of Forbes and Hanley is against the existence of specific difference between the two.

Helix nemoralis. Frequent, especially on the chalk ; varying, as elsewhere, in colour and number of bands.

„ *Pomatia*. On the chalk, frequent.

„ *arbustorum*. Local, and not common.

„ *lapicida*. Rather frequent, more so on the chalk-hills, at the roots of hedges, &c.

„ *pulchella*. Well diffused and plentiful in some localities ; the var. *costata* is also to be found here.

„ *Cantiana*. Very common.

„ *fulva*. Not uncommon, though rather local ; under decaying wood among damp moss.

„ *aculeata*. Rather well diffused, but not common.

„ *sericea*. Scarce.

„ *hispida*. Abundant ; varying in colour and the elevation of the spire, but the thick yellowish white foot of the animal seems to afford a good point of distinction between it and the following.

„ *concinna*. Less frequent. I have collected this shell in many localities, from the neighbourhood of London, in Sussex, in Kent, also in Ireland, and have found the characteristics of the animal, its dark colour, the foot narrower and far less fleshy than the last, well preserved in all.

„ *rufescens*. Common ; the white variety is also not unfrequent.

„ *virgata*. Unequally distributed through the district ; common on the chalk.

„ *caperata*. Local, and less frequent than the last.

„ *depilata*. Rare and local. Marant's-court Hill.

„ *ericetorum*. Very abundant on the chalk.

Zonites rotundatus. Very common here, as in almost every other district I have searched. I have found the somewhat rare, transparent, and colourless variety.

„ *pygmæus*. Rare ; Knole Park.

„ *allarius*. Very frequent ; occasionally colourless, or of a transparent greenish hue.

„ *cellarius*. Frequent, but not large ; sometimes colourless.

„ *nitidulus*. Abundant.

„ „ var. *Helmii*. Rare.

„ *lucidus*. One locality ; the bank of a slow stream, near Bradbourne.

Zonites crystallinus. Rather common.

„ *purus*. Less frequent than the last.

Succinea putris. Well distributed, but usually of small size.

Bulimus obscurus. Generally diffused, but not abundant; I have found a few beautiful specimens of the transparent, almost colourless variety.

Zua lubrica. Common. Albino var. chalk-hills about Kemsing; rare.

Azeca tridens. One locality, and there not plentiful; near Stansted, among moss upon a chalky soil: of this also I possess one albino specimen.

Achatina acicula. A few localities, but rare.

Pupa umbilicata. This shell, abundant in other districts which I have examined (especially near St. Leonard's), is here rare; as yet I know but one locality,—the Vine Lodge, where it was shown me by Alfred Northey, Esq.

„ *marginata*. Rare; found by Lady A. Pratt, at Marant's-court Hill.

„ *pygmæa*. Rare; Knole Park, and single specimens in two other localities.

„ *palustris*. Moss near the Darent, not common; I have found specimens attached with other shells to the cases of caddis worms.

Balea perversa. Rather frequent on decaying beech-trees in Chance Wood, Wildernesse Park.

Clausilia bidens. Well diffused, but not generally abundant; most frequent on the chalk at the roots of hedges, &c. I have taken a few fine examples of the greenish white variety.

„ *Rolphii*. This rare shell is found in two localities in Wildernesse Park, but the most diligent search has yielded very few specimens: I obtained it at Hastings, as indicated by Gray; and possess several from Ashurst Park, Tunbridge Wells, collected by H. Field, Esq., jun.

„ *nigricans*. Common; one curious reversed specimen has been found in this district.

Carychium minimum. Abundant.

Acme fusca. Quarry near Wildernesse; very rare.

Lymnæus pereger. Common.

„ „ var. *acutus*. Occasional.

„ „ var. *lacustris*. Near the Darent; I also obtained it near St. Leonard's-on-Sea.

Lymnæus stagnalis. In the Darent, but more frequently in ditches near the river. In North Holland, and near the Maes, I have observed this shell attain a size quite unknown in British specimens.

„ *palustris*. Frequent; the var. with the violet-brown tinge in the throat occurs also.

„ *truncatulus*. Stream near Kemsing; rare.

„ *glaber*. Medway, near Maidstone.

Ancylus fluviatilis. Frequent, in a small stream near Kemsing, and at Bradbourne.

Velletia lacustris. Abundant, in two small ponds in Knole Park, on the dead leaves of oak, beech, &c. that have lain some time in the water.

Aplexus hypnorum. Slow stream near Kemsing; rare.

Physa fontinalis. Ditches near the Darent. I possess one specimen resembling the figure in Turton marked *rivalis*, very much larger than ordinary.

Planorbis albus. The Darent; rare.

„ *lævis*. This local shell, which, as far as I am aware, has not previously been found in any south-eastern county, seems confined to one locality here, the same stream that yielded me *Aplexus hypnorum*; but there it is abundant.

„ *imbricatus*. Plentiful, in a small pond near the "Grove;" scarce elsewhere.

„ *marginatus*. Common.

„ *vortex*. Local.

„ *spirorbis*. Common.

„ *contortus*. Stream near Kemsing and near the Darent.

„ *nitidus*. Ponds in Knole Park.

Cyclostoma elegans. On the chalk, in extraordinary numbers, more frequently without the dark markings.

Cyclas cornea. Very common.

„ *rivicola*. Medway, near Maidstone; found by H. Field, Esq., jun.

Pisidium nitidum. Not uncommon in one small pond near Wildernes Park.

„ *pusillum*. Locally abundant.

„ *pulchellum*. Frequent in a stream near Kemsing.

„ *amnicum*. In the Darent.

Anodon Cygneus. Abundant, in a pond at Fairlawn, and found in the Darent.

Unio tumidas. This shell is abundant in large ponds near Bayham Abbey, Tunbridge Wells, and also in the Thames, but I have not yet found it nearer to my district.

R. H. S. SMITH.

Wilderness Park, Sevenoaks, Kent,
April, 1854.

Note on Gluphisia crenata.—The larva taken by me at Halton, on the 18th of August, 1853, and supposed to be *G. crenata*, produced that insect on the 4th of March last, and which was exhibited by Mr. Douglas at the April meeting of the Entomological Society—*Joseph Greene*; 49, *Stephen's Green, Dublin, April 15, 1854*.

Note on Notodonta cucullina.—A fine female made its appearance on the 14th of this month.—*Id.*

Early appearance of Cucullia Chamomilla.—In the autumn of last year I captured, on *Anthemis arvensis*, four larvæ of this uncommon species; one made its appearance yesterday, the 26th instant, and is a very fine specimen. Westwood names May and June as the usual time of their appearing.—*W. H. Hayward*; *Devonport, Devon, January 27, 1854*.

Irregularity of the appearance of Cucullia Chamomilla.—Since my communication of the 27th of January, I had another specimen emerge on February 26th, and a third on April 10th. Why I deem this worthy of remark, is, that the larvæ of the whole descended within a day or two of each other.—*Id.*; *April 11, 1854*.

Capture of Cheimastobia borearia near Great Marlow, Buckinghamshire.—Walking through Rudgely Wood, two miles from Marlow, one day last November, I observed some moths at rest on the trunks of beeches, of which the wood is almost exclusively composed. Thinking they were *Dilutaria*, though small specimens, and paler than usual, I pinned two or three into my hat, rather to prove to a young entomologist that moths might be taken at rest on a frosty morning, than with any other purpose. On examining them, however, at home, I found they were *C. borearia*. I returned a few days after to search for the birches, on which I had been told that *C. borearia* constantly feeds; to my surprise, there seemed to be hardly a birch in the wood, and a suspicion crossed my mind, that the insect might prove after all not to be a strict birch-feeder. This impression was strengthened, a few days after, by finding more specimens of *C. borearia*, in casually walking through the beech-woods of Stonor Park, eight miles from here, where I was told there were no birches at all near. I do not vouch, however, for the accuracy of this information. Some of the specimens were soon after sent to an esteemed friend and correspondent in the North, who is in the habit of taking the insect there; and he pronounced them not only to be *C. borearia*, but finer and larger than those usually taken in that part of the country, and more resembling those of the Continent.—*Bernard Smith*; *Great Marlow, Bucks, January 9, 1854*.

Larva and Transformation of Ochsenheimeria Birdella.—About the beginning of May the Holci, or soft grasses, have attained a length of some few inches, and in the stems of these feed the larvæ of *Ochsenheimeria Birdella*. Care must be taken in extracting them from the ground. The grass should be seized as low down as possible,

else the caterpillar is very liable to be crushed. The mode of ascertaining whether anything be in the grass, is by noticing whether the centre leaf be discoloured, not mined. Of course, if the larva has just taken possession of its new home, the discolouration may not be discernible, and it is therefore necessary to examine all the plants. If, on opening any of them, there should be a pale buff larva, slightly attenuated at each end, and with a minute spot on the anterior edge of each segment just above the spiracles, you have the object of your search. It grows to about half-an-inch in length, and changes about the middle of May: the perfect insect coming forth in the beginning of July. The chrysalis is pale brown, enclosed in a snow-white cocoon.—*John Scott; Ferry Road, Renfrew, February 28, 1854.*

Note on Colletes Daviesana.—When in Cumberland last July, I found some cocoons protruding from a bank, and quite exposed to the vicissitudes of the weather, from the sandy soil having been excavated beneath. These I brought home with me, and in August following, bred from them three females and one male of *Colletes Daviesana, Kirby*. A host of small parasitical Hymenoptera made their appearance a few days earlier than the *Colletes*, but I am quite ignorant of their generic or specific names. The cocoons were brownish, rather thick, of a firm texture, and enclosed, end to end, in an outer envelope, of a dirty white colour, somewhat resembling fine tissue paper.—*Thomas John Bold; Angas' Court, Bigg Market, Newcastle-on-Tyne, February 7, 1854.*

Capture of Andrena analis in Cumberland and Northumberland.—I found a colony of *Andrena analis, Panz.*, in a sandy hedge-row, partially covered by heath, near Naworth Castle, Cumberland, and another in a similar locality, a little below Featherstone Castle, Northumberland, in July last. The females were most abundant, and were captured as they entered their burrows, whilst the males were enjoying themselves on the flowers of *Hieracium* near by. The first colony had a western, and the last an eastern exposure. I took a few specimens of *Nomada flavoguttata*, entering the burrows of the *Andrena*; perhaps it is parasitical upon the species.—*Id.*

Capture of Andrena coitana (Kirby), in Cumberland.—This species, like *A. analis*, is a dweller in upland regions, where it is found in warm sheltered nooks near the water; *A. analis*, on the contrary, preferring high unsheltered situations. The males begin to appear towards the end of June, and the females a week or two later. I found both sexes on the banks of the river Irthing, a little below the Wall-holme. The females frequent the flowers of *Hieracium* and brambles, preferring the latter; the males are sometimes found with their partners, but are to be taken in most abundance by examining the flowers of *Campanulæ* towards evening, and early in the morning, where they will be found asleep, coiled about the pistil. Although the sexes were in plenty, I was unable to trace them to their nidi, which I fancy are not far from the water; for although I sometimes got males upon the hill-sides, yet I never found females but in the hollows. One female has a *Stylops* protruding from its abdomen.—*Id.*

Capture of Andrena testiva (Smith), in Cumberland.—I took in July about half-a-dozen males in the same locality as *A. coitana*; they frequented the same flowers, and, like the male of that species, often sleep in the smaller *Campanulæ*. The specimens were in such good order, that I think the females had not appeared. This species, like *A. analis*, emits a very pungent odour, resembling garlic, when laid hold of.—*Id.*

Note on Anobium paniceum.—The same grocer from whom I got the *Ulcma*, had

a quantity of Italian macaroni destroyed by *Anobium panicum*, *Lin.* It was breeding freely, and had burrowed to such an extent in the macaroni, as to render it completely worthless before the mischief was discovered. From their first nidi they have wandered over the whole shop, and are now found wherever farinaceous substances are kept.—*Id.*

Catalogue of Coleoptera found in the Neighbourhood of Dublin.

By A. R. HOGAN, Esq.

(Concluded from page 4199).

<i>Leipus nebulosus</i> , <i>L.</i> Rathfarnham, &c.;	<i>Haltica cœrulea</i> , <i>Pk.</i> Phoenix Park; on
on chestnut-trees.	flags.
<i>Rhagium bifasciatum</i> , <i>F.</i> Powerscourt.	" <i>ferruginea</i> , <i>Schr.</i> Roebuck, Fir-
<i>Strangalia elongata</i> , <i>Ste.</i> Ditto.	house, &c.
<i>Grammoptera ruficornis</i> , <i>F.</i> Ditto.	" <i>flava</i> , <i>Ste.</i> Local.
" <i>lævis</i> , <i>F.</i> Glasnevin, &c.;	" <i>Helixines</i> , <i>F.</i> Firhouse, &c.; on
on Umbelliferæ.	willows.
<i>Donacia cincta</i> , <i>Germ.</i> Botanic Garden	" <i>oleracea</i> , <i>L.</i> Dodder banks.
at Glasnevin.	" <i>Modeeri</i> , <i>F.</i> Portmarnock?
" <i>crassipes</i> , <i>F.</i> Taken by Mr.	<i>Thyamis tabida</i> , <i>Ol.</i> On <i>Senecio Ja-</i>
Tardy.	cobæa.
" <i>Sagittariæ</i> , <i>F.</i> Portmarnock.	" <i>atricilla</i> , <i>Ste.</i> Local.
" <i>Proteus</i> , <i>Kunz.</i> Glasnevin.	" <i>ochroleuca</i> , <i>Ste.</i> Killiney; on
" <i>Lemnæ</i> , <i>F.</i> Taken by Mr. Tardy.	<i>Ononis arvensis</i> .
" <i>linearis</i> , <i>Hope.</i> Glasnevin; on	" <i>lurida</i> , <i>Gyl.</i> Common.
<i>Sparganium</i> .	" <i>holsatica</i> , <i>L.</i> Local.
<i>Crioceris cyanella</i> , <i>Ste.</i> Firhouse.	<i>Macrocnema Hyoscyami</i> , <i>Ent. Hft.</i> Fir-
" <i>puncticollis</i> , <i>Cts.</i> Ditto.	house?
" <i>melanopa</i> , <i>Ste.</i> Rathfarnham	" <i>marcida</i> , <i>Ill.</i> Portmarnock.
Park.	" <i>exoleta</i> , <i>Ste. (Mant.)</i> Roches-
<i>Cassida rubiginosa</i> , <i>Ill.</i> Dodder banks?	town; by Mr. Molloy.
<i>Galeruca Tamaceti</i> , <i>L.</i> Taken by Mr.	" <i>chrysocephala</i> , <i>L.</i> Taken by
Tardy.	Mr. Tardy.
" <i>Cratægi</i> , <i>Dft.?</i> Local.	" <i>Rapæ</i> , <i>Ill.</i> Dodder banks.
" <i>Nymphææ</i> , <i>L.</i> Ditto.	<i>Chætocnema concinna</i> , <i>Ste.</i> Local.
" <i>Caprææ</i> , <i>Ste.?</i> Ditto.	" <i>aridella</i> , <i>Pk.?</i> Rare.
<i>Haltica Lepidii</i> , <i>Ent. Hft.</i> Glasnevin	<i>Sphæroderma testaceum</i> , <i>F.</i> Local.
and Portmarnock.	" <i>orbiculatum</i> , <i>Mm.</i> Port-
" <i>Brassicæ</i> , <i>F.</i> Taken by Mr.	marnock.
Tardy.	<i>Timarcha coriaria</i> , <i>F.</i> Taken by Mr.
" <i>nemorum</i> , <i>L.</i> Local.	Tardy.
" <i>Rubi</i> , <i>F.</i> Ditto.	<i>Chrysomela polita</i> , <i>L.</i> Local.

- Chrysomela Staphylæa*, *L.* Local.
 „ *Banksii*, *Ste.* Roebuck, &c.; abundant.
 „ *lamina*, *F.* Clonskeagh, &c.; scarce.
Helodes Beccabungæ, *Pz.* Banks of the Dodder.
 „ *auctus*, *F.* Taken by Mr. Tardy.
Phædon marginella, *Ste.* Dodder banks.
 „ *Vitellinæ*, *L.* Local.
 „ *Raphani*, *F.* On docks; comn.
 „ *Cochleariæ*, *F.* On cow-parsnips.
Coccinella septempunctata, *L.* Common.
 „ *variabilis*, *Ill.* Ditto.
 „ *conglomerata*, *Ste.* Local.
 „ *quatuordecim-punctata*, *L.* Near Dundrum.
 „ *tredecim-punctata*, *L.* Portmarnock? on willows.
 „ *octodecim-guttata*, *L.* Taken by Mr. Tardy.
Scymnus discoideus, *F.* Portmarnock; very rare.
Rhyzobius litura, *F.* Baldoyle; abundt.
Caticula pectoralis, *Ste.* Portmarnock; on dwarf willows.
Stene ferruginea, *Ste.* Taken by Mr. Tardy.
Tenebrio obscurus, *F.* Dublin; in stables.
Phylan gibbus, *F.* Portmarnock.
Crypticus quisquilius, *Pk.* Ditto.
Blaps mortisaga, *Ste.* Dublin; in cellars and stables.
Helops striatus, *Ste.* Taken by Mr. Tardy.
Lagria hirta, *L.* Portmarnock and Killinney.
Melandrya caraboides, *L.* Malahide; taken by Dr. Lloyd.
Anaspis frontalis, *L.* Phoenix Park; on hawthorn flowers.
 „ *ruficollis*, *Gffry.* Same locality.
 „ *obscura*, *Gyl.* Same locality.
Proscarabæus violaceus, *Mm.* Roebuck, Merriion, &c.; very uncertain in its appearance.
Proscarabæus vulgaris, *Ste.* Portrane sds.
Isochnomera melanura, *Ste.* Glasnevin Botanic Gardens; on *Serophularia*
Anthieus floralis, *F.* Powerscourt.
Scydmaenus tarsatus, *Müll.* Taken by Mr. Tardy.
Pselaphus Heisii, *Hbst.* Malahide Hill.
Euplectus Karstenii, *Rchb.* ² Local.
Autalia rivularis, *Grav.* Portmarnock, &c.
 „ *impressa*, *Ol.* ² Local.
Falagria sulcata, *Pk.* Portmarnock, &c.
Calodera nigricollis, *Pk.* Malahide.
Tachyusa atra, *Grav.* Dodder banks.
Astilbus canaliculatus, *F.* Portmarnock, &c.; common.
Polystoma obscurella, *Ste.* Portmarnock and Malahide.
Calicerus obscurus, *Ste.* Same locality.
Bolitochara circellaris, *Grav.* Malahide; very common.
 „ *analis*, *Grav.* Ditto.
 „ *socialis*, *Pk.* Local.
Oligota subtilis, *Er.* Ditto.
Encephalus complicans, *Wwd.* Portmarnock; rare.
Aleochara fuscipes, *Grav.* Not uncommon.
 „ *nitida*, *Grav.* Portmarnock.
 „ *lanuginosa*, *Gyl.* Local.
 „ *mæsta*, *Grav.* Ditto.
Oxypoda opaca, *Grav.* Portmarnock?
Diglossa mersa, *Hal.* Baldoyle; for description of exact locality, &c., see 'Zoologist,' (Zool. 3464). Subsequent experience has, however, convinced me that the insect is much more abundant than might be supposed from the account there given.
Tachyporus thoracicus, *Ste.* Local.
 „ *chrysomelinus*, *L.* Ditto.
 „ *marginellus*, *Ste.* Ditto.
 „ *Hypnorum*, *F.* Everywhere.
Hypocyptus leviusculus, *Ste.* Portmarnock; on the bent-grass.
Conurus pubescens, *Grav.* Local.
 „ *pedicularius*, *Grav.* Killiney, &c.

- Megacromus analis*, *Ste.* Local.
Tachinus silphoides, *L.* On dunghills.
 " *marginellus*, *F.* Local.
 " *subterraneus*, *L.* Phoenix Park?
 " *elongatus*, *Gyl.* Chapelizod
 Glen.
 " *rufipes*, *Ste.* Not uncommon.
Creophilus maxillosus, *L.* On carcases.
Trichoderma pubescens, *Deg.* Abundant.
Staphylinus erythropterus, *Ste.* Ditto.
 " *castanopterus*, *Ste.* Local.
 " *ænecephalus*, *Ste.* Ditto.
Goërius olens, *Müll.* Frequent.
Ocypus similis, *F.* Local.
Quedius tristis, *Grav.* Dalkey.
 " *impressus*, *Pz.* Portmarnock;
 common.
 " *discoideus*, *Ste.* Local.
Raphirus semiobscurus, *Ste.*? Ditto.
 " *boops*, *Grav.* Ditto.
Philonthus splendens, *F.* College Park.
 " *politus*, *L.* Frequent.
 " *marginatus*, *F.* Ditto.
 " *sanguinolentus*, *Grav.* Port-
 marnock.
Cafus xantholoma, *Ste.* Baldoyle, &c.;
 on the sea-sands.
 " *fucicola*, *Ste.* Killiney, &c.
Gabrius aterrimus, *Grav.* On the sea-
 coast.
Remus sericeus, *Ste.* Malahide.
Othius fulvipennis, *F.* Local.
 " *melanoccephalus*, *Grav.* Ditto.
 " *læviusculus*, *Ste.* Ditto.
Xantholinus glabratus, *Grav.* Scarce.
 " *punctulatus*, *Pk.* Baldoyle.
 " *linearis*, *Ol.* Local.
Leptacinus parumpunctatus, *Gyl.* Dung-
 hills.
 " *batychnus*, *Gyl.*? Local.
Lathrobium brunnipes, *Grav.* Phoenix
 Park?
 " *fulvipenne*, *Grav.* Same lo-
 cality?
 " *elongatum*, *L.* Local.
 " *multipunctatum*, *Grav.* Do.
 " *angusticollis*, *Boisd.* A speci-
 men by the Dodder, near Fir-house.
Sunius ochraceus, *Grav.* Dodder banks.
Astenus angustatus, *Pk.* Malahide.
Rugilus rufipes, *Er.* Local.
 " *orbiculatus*, *Er.* Ditto.
 " *affinis*, *Er.* Ditto.
Stenus guttula, *Müll.* Dodder banks and
 Loughlinstown.
 " *Juno*, *Ste.* Common.
 " *bupthalmus*, *Grav.*? Ditto.
 " *nitidus*, *Er.*? Ditto.
 " *speculator*, *Er.* Ditto.
 " *pumilio*, *Er.* Ditto.
 " *unicolor*, *Er.* Ditto.
 " *Aceris*, *Ste.* Ditto.
 " *picipes*, *Ste.* Ditto.
 " *tarsalis*, *Ste.* Local.
 " *oculatus*, *Grav.* Everywhere.
Bledius tricornis, *Hbst.* North Bull
 Sands, &c.
Hesperophilus arenarius, *Pk.* Baldoyle
 and Portmarnock.
Phytosus spinifer, *Ste.* One specimen on
 Portrane Sands.
Platysthetus morsitans, *Pk.* Local.
Oxytelus rugosus, *F.* Ditto.
 " *nitidulus*, *Grav.* Ditto.
 " *piceus*, *L.* Common.
 " *sculpturatus*, *Grav.* Ditto.
 " *depressus*, *Grav.* Ditto.
Megarthus depressus, *Pk.* Local.
Proteinus atomarius, *Er.* Portmarnock;
 rare.
 " *brachypterus*, *F.* In putres-
 cent agarics.
Phlæobium clypeatum, *Müll.*? Local.
Omalium deplanatum, *Gyl.* On a win-
 dow, in Dublin.
 " *rivulare*, *Grav.* Common.
 " *subpubescens*, *Ste.* Phoenix
 Park; abundant on furze.
Deleaster dichrous, *Grav.*? Taken by
 the late J. Egan, Esq.
Thinobius longipennis, *Hær.* Near Fir-
 house; by the Dodder.
Trogophleus pusillus, *Grav.* Dodder
 banks.
Lesteva obscura, *Pk.* Ditto?

In the course of publication it has unavoidably become necessary to make the following additions and corrections:

ADDENDA.

Page 4155. After *Trechus falkus*, insert

Blemus pallidus, Ste. (*Trechus labidosus*, Dawson). Of this local species I captured a specimen on the beach at Killiney; it has also been taken by Mr. Halday, at Hollywood, Co. Down.

Page 4136. At foot of second column, insert

Limnius variabilis, Ste. Loughlinstown?

Elmis parallelopipedus, Mill. Dodder.

„ *Volkmaria*, Pz. Enniskerry.

Page 4197. After *Melolontha vulgaris*, insert

Melolontha Hippocastani, F. Roebuck; taken by James Haughton, Esq.

Melanotus rufipes, Hbst. Taken by Mr. Tardy.

Page 4198. After *Elleuscanicus*, Ph., insert a note of interrogation (?).

CORRIGENDA.

Page 4135. *Dele Agonum Bogemanni*, Ste.

Page 4136. For *Elaphrus riparius*, L., &c., read

Elaphrus cupreus, Dj. Glen near Ticknock; by R. H. S. Smith, Esq.

After *Helophorus griseus*, Hbst. Local: insert

Helophorus nubilus, F. Clontarf; by Miss M. Ball. It is to this species, and not to the preceding, that the note respecting the variety should be appended.

Page 4197. *Dele Apitarsus rufipes*, F.

On the Catalogue thus concluded there is little to remark, save the absence of many species usually common in similar localities, which constant observation during the past half century has failed to discover, and few of which I think likely to be brought to light hereafter, notwithstanding Mr. Douglas's very encouraging remarks on "Terra Incognita." We have hardly anything to compensate us in the way of species considered rare or local in other parts of the British Isles, with the exception, perhaps, of *Trechus labidosus*, *Heterocerus femoralis*, *Lathrobium angusticolle*, *Thinobius longipennis*, and two or three more; even *Diglossa mersa* is no longer peculiar to the Irish coast, having been taken in large numbers on the coast of France, in the year 1852, by Messrs. Blanchard and Signoret, and in Scotland by M. Javet. In one genus only have we more than the proportion of species that might be expected, namely, *Cercyon*;

the thirteen species of which, acknowledged as European, have all been found in Ireland, and eleven within the limits of the County Dublin.

That other collectors, however, of whose existence I may be as yet unaware, have taken more, and possibly remarkable species not known to me as occurring in the neighbourhood, I would not wish to seem to doubt, and I hope they will not fail to make their discoveries public, either by sending notices of them to the 'Zoologist,' or, if they prefer it, communicating them to me for a future Appendix: thus may the very imperfections of the present list tend to the advancement of science, and to the encouragement of new votaries to the study, who, if they would reap the highest and best fruit of their labours, will not forget, I trust,—

"To trace in Nature's most minute design
The signature and stamp of Power Divine,
Contrivance intricate, expressed with ease,
Where unassisted sight no beauty sees,
The shapely limb and lubricated joint,
Within the small dimensions of a point;
Muscle and nerve miraculously spun,
His mighty work, who speaks and it is done;
The Invisible in things scarce seen revealed,
To whom an atom is an ample field."

Cowper.

So will the lover of Entomology, whom the cheering fragrance of returning spring once more tempts to ramble forth from the scenes of his winter labours, soon finds his way—

"To regions where, in spite of sin and woe,
Traces of Eden are still seen below,
Where mountain, river, forest, field, and grove,
Remind him of his Maker's power and love."

Cowper.

A. R. HOGAN.

Charlton, Dundrum, near Dublin,
February, 28, 1854.

Note on Ophiocoma Ballii.—Since my former notice of this species, I have seen a very perfect specimen in the possession of Mr. Edwards, of Banff, having six distinct and fully developed rays.—*George Harris; Gamrie, April, 1854.*

Note on Uraster hispida. — Being in the way of supplementing deficiencies, allow me to correct an error in my notice of the little cross-fish (Zool. 3305), where, referring to the number of rays, *four* is printed in place of *five*.—*Id.*

NOTICES OF NEW BOOKS.

‘*The Annals and Magazine of Natural History.*’ No. 76, dated April, 1854; *price* 5s.: and No. 77, dated May, 1854; *price* 2s. 6d. London: Taylor & Francis, Red Lion Court, Fleet Street.

The contents of the April number are as follows:—

‘On the Structure of the Echinoderms.’ By Joannes Müller.

‘Description of a new Species of Closterium, (*Closterium Griffithsii*).’ By the Rev. M. J. Berkeley, M.A., F.L.S.

‘Notes on the Ornithology of Ceylon, collected during an Eight Years’ Residence in the Island.’ By Edgar Leopold Layard, F.Z.S., C.M.E.S., &c.

‘Monograph of the British Graphideæ.’ By the Rev. W. A. Leighton, B.A., F.B.S.E.

‘A Reply to two Statements published by the Palæontographical Society, in their volume for 1853; one appearing to accuse the University of Cambridge of illiberality in the administration of its Museum; the other reflecting on Professor M’Coy.’ By the Rev. Professor Sedgwick, M.A., F.R.S., &c.

‘Notice of the Discovery of Desmarestia Dresnayi on the Coast of Ireland.’ By R. K. Greville, LL.D., &c.

‘On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.’ By Thomas Williams, M.D. Lond.

‘Contributions to the Palæontology of Gloucestershire:—A Description, with Figures, of some new Species of Echinodermata from the Lias and Oolites.’ By Thomas Wright, M.D., &c.

Bibliographical Notices:—‘Botanical Letters to a Friend.’ By Dr. F. Unger. Translated by Dr. Paul. ‘Synopsis des Caloptérygines.’ Par M. E. de Selys-Longchamps.

Proceedings of Learned Societies:—Royal Institution of Great Britain—Zoological—Botanical of Edinburgh.

Miscellaneous:—Note on the Vegetation of Mount Argæus in Cappadocia; by M. P. de Tchihatcheff. On certain Statements contained in Dr. T. Williams’s paper on the Respiratory Organs of the

Articulata; by George Newport, F.R.S. On the Genera *Volutella* and *Cymbeola*; by Dr. J. E. Gray. Observations on *Notamia bur-saria*; by G. H. Kingsley, M.D. Description of a new Species of *Helix* from Van Diemen's Land; by Lovell Reeve, F.L.S., &c. On the Colours of Plants; by M. Martens: extracted from the 'Bulletins de l'Acad. Royale de Bruxelles,' vol. xx. pt. 1, p. 232.

The paper by Professor Sedgwick, with its elaborate title, contains not one word of instruction for the naturalist. Messrs. Selby, Johnston, Babington and Balfour have doubtless been seduced into the publication of these 12 pages, thinking the Professor's name a great "catch," and well worth the extra 2s. 6d. charged for this number. How exactly was this the case with Mr. Loudon, in the once admirable old 'Magazine of Natural History,' in the memorable Vigors and Swainson controversy! It was first announced with a "Look here!" then it was treated as mere respectable matter; then the combatants were requested to be brief; then it was made an Appendix matter; and finally, the combatants were stopped by being told that they must carry on the war at their own cost. We trust the Sedgwick controversy will reach that "lame and impotent conclusion," without passing through the intermediate stages.

The late Mr. Newport's brief communication deserves our thanks, although we think it a little too acid. "I have observed," says Mr. Newport, "with surprise and regret, such a mass of erroneous statements in the papers now publishing in the 'Annals' on the respiratory organs of the Articulata, by Dr. T. Williams, that I write at once to say, that at a future period, at my earliest convenience after Dr. Williams has completed his remarks on the subject of the blood and the respiratory structure, I shall feel myself called upon to beg for space in your journal to attempt to remedy the injury which these errors are likely to inflict on science by their promulgation." Approving as we do of Mr. Newport's censures on the publication of such a paper, a reply is quite unnecessary. We should think that very few are sufficiently read in the internal anatomy of insects, to relish so diffuse a paper; and those who are, will not require that its short-comings should be pointed out to them.

The May number contains the following papers:—

'A Synopsis of the Fissirostral Family Bucconidæ.' By Philip Lutley Sclater, M.A., F.L.S.

'Observations on the Fauna of Barrackpore.' By Captain Robert C. Tytler, of the 38th Regiment Bengal Light Infantry.

'Contributions to the Palæontology of Gloucestershire: — A Description, with Figures, of some new Species of Echinodermata from the Lias and Oolites.' By Thomas Wright, M.D., &c.

'Observations on Professor Sedgwick's "Reply to some Statements reflecting on the University of Cambridge."' By J. S. Bowerbank. F.R.S.

'Monograph of the British Graphideæ.' By the Rev. W. A. Leighton, B.A., F.B.S.E.

'Notices of British Fungi.' By the Rev. M. J. Berkeley, M.A., F.L.S., and C. E. Broome, Esq.

'Descriptions of new Species of Ceylon Reptiles.' By Dr. Kelaart.

'A Revision of the Arrangement of the Families of Bivalve Shells, (Conchifera).' By John Edward Gray, Ph.D., F.R.S., V.P.Z.S., &c.

'On the Reproduction of a lost part of an Operculum, and of its probable Restoration when entirely destroyed.' By John Edward Gray, Ph.D., F.R.S., V.P.Z.S., &c.

Proceedings of Societies: — Linnean.

Miscellaneous: — *Runcina Hancocki*; by Dr. J. E. Gray. Note on the Coloration of the Chinese Sea; by M. Camille Dareste.

Mr. Bowerbank's "Observations," like those which have called them forth, contain no Natural-History matter; but in three pages the writer utterly demolishes Professor Sedgwick's elaborate "Reply." No counter-pleading can remove the impression conveyed by Mr. Bowerbank's "Observations."

'*Transactions of the Entomological Society of London.*' New Series. Vol. II., Part 8. Demy 8vo., with 2 plates. Price 4s. London: Longman. 1854.

This part contains the following papers: —

'On the Insects used for Food by the Indians of the Amazon.' By A. R. Wallace, Esq.

'Descriptions of some new Species of Butterflies from South America.' By W. C. Hewitson, Esq.

'Notes on the Habits of a Bee-parasite, *Melittobia Acasta*.' By Frederick Smith, Esq.

'On the Habits of the Butterflies of the Amazon Valley.' By A. R. Wallace, Esq.

Mr. Wallace's paper on insects used as food is highly interesting. After stating that insects afford the Indians some of their greatest luxuries, he thus particularizes the species.

"The first is a great-headed red ant, the *Cecodoma cephalotes* of Latreille. This insect inhabits the whole Amazon district, and, I believe, a great part of Brazil and Guiana, and is one of the most destructive of the whole family. It frequents sandy districts, and places where 'red earth' is found, but is absent from the 'black earth,' or the rich alluvial soil of the Amazon. It forms its nests in the woods and in gardens, turning up the soil in such large heaps as to make one doubt whether so small an insect could have been the workman. I have seen elevations of this kind twenty feet square and a yard high, containing many tons of earth. These hillocks are riddled with holes in every direction, and into them the ants may be seen dragging little circular pieces of leaf, which they cut off from particular trees which they prefer; orange-trees and leguminous shrubs suffer most from their ravages, and these they will sometimes entirely strip of their leaves in a night or two. Young plants, too, of every kind suffer very much, and cannot be grown in many places on account of them. They remain in one locality a long time; for on my observing to a gentleman at a cattle-estate near Pará, how remarkably the track of these ants was worn down across a pathway and through grass, he informed me that he had observed them marching along that very track for fifteen or twenty years. The insects which do this are, of course, the neuters, which have tremendous jaws. They often swarm in houses at night, crawling over the supper-table, and carrying away fragments of bread and farina; and should any cloth or handkerchief be left on the ground, especially with anything eatable in it, it will be found in the morning cut into semicircular holes in every direction as neatly as if done with scissors. It is the female of this destructive creature that furnishes the Indian with a luxurious repast. At a certain season the insects come out of their holes in such numbers, that they are caught by basketsfull. When this takes place in the neighbourhood of an Indian village, all is stir and excitement; the young men, women, and children go out to catch *saiúbas* with baskets and calabashes, which they soon fill; for though the female ants have wings, they are very sluggish, and seldom or never fly. The part eaten is the abdomen, which is very rich and fatty, from the mass of undeveloped eggs. They are eaten alive; the insect being held by the head, as we hold a strawberry by its stalk, and the abdomen being bitten off, the body, wings and legs are

thrown down on the floor, where they continue to crawl along apparently unaware of the loss of their posterior extremities. They are kept in calabashes or bottle-shaped baskets, the mouths of which are stopped up with a few leaves, and it is rather a singular sight to see for the first time an Indian taking his breakfast in the *saúba* season. He opens the basket, and as the great-winged ants crawl slowly out, he picks them up carefully and transfers them with alternate handfuls of farina to his mouth. When great quantities are caught, they are slightly roasted or smoked, with a little salt sprinkled among them, and are then generally much liked by Europeans.

"The next insect in the list is the *Termes flavicolle*, *Perty*; a large white ant common in the Upper Amazon. It inhabits holes in the earth about the roots of rotten trees, and is much sought after for food by the great ant-eater (*Myrmecophaga jubata*), as well as by the Indians. In this case it is not the winged female that is eaten, but the great-headed, hard-biting worker, and it is by means of his jaws that the creature is entrapped. An Indian boy going after *cupim*, takes with him a calabash or a bottle basket, and searches about for a nest. He then scrapes away some of the earth, and taking a long piece of grass inserts it as far as it will go, and on withdrawing it, finds ten or a dozen *Termes* holding tightly on to it; and he repeats this operation till he fills his basket. These insects are also eaten alive or roasted; but in this case it is not the abdomen, but the enormous head and thorax which is devoured, as those parts contain a considerable mass of muscular matter. These insects have generally a bitter taste, and are not much esteemed except by the Indians themselves.

"The edible Homopterous insect is the *Umbonia spinosa*, which swarms at certain seasons on the Inga trees, which are universally planted by the Indians near their cottages, for the sake of the fruit, which is much esteemed by them. The insects fall upon the ground in great numbers, and the sharp spine on their thorax renders walking barefoot very disagreeable. This spine seems to render them very ill adapted for food, but when they first appear the whole body is soft and flaccid, and they are then collected and roasted in a flat earthen pan. They are not, however, so much esteemed as the other insects I have mentioned.

"The next edible insect I shall allude to is the larva of a beetle, but of what species or genus I am unable to say, though it is probably a *Calandra*, as it is found in the stem of a palm-tree. It is much swollen, and attenuated at each end; and is a rich fatty mass, which

is eaten slightly roasted or fried. It is not by any means so common in the Amazon as the other edible insects; and in fact, I never saw it eaten, or ate it myself, but once. It is called *muxiwa* by the Indians.

"The Apterous insect which is eaten by the South-American Indians, more, I presume, as a delicacy than as an article of food, is a species of *Pediculus* which inhabits the heads of that variety of mankind, and is probably a distinct species from that of our own country. The method of capturing and devouring this insect is exactly the same as that which every one has seen adopted by the monkeys at the gardens of the Zoological Society. A couple of Indian belles will often devote a spare half-hour to entomological researches in each other's glossy tresses, every capture being immediately transferred, with much gusto, to the mouth of the operator."—P. 242.

The butterflies described by Mr. Hewitson are *Erycina Saundersii*, *Acraea Amida*, *Papilio Conon*, *Hætera Hortona*, *Hætera Hypesia*, and *Dircenna Duillia*: all of them are very beautifully figured.

The papers by Mr. Smith on *Melittobia*, and by Mr. Wallace on the butterflies of the Amazon, are replete with interest.

'Monograph of the Psychidæ.' By M. BRUAND.

This admirable Monograph forms part of the '*Mémoires de la Société libre d'Emulation du Doubs*,' but we learn from the wrapper that it is also published separately, with the plates either coloured or plain; copies of the former are charged 7 francs each, of the latter, 9 francs each.

This is one of those careful and elaborate treatises which are now becoming common on continental Europe, but which are unfortunately so rare here. Probably a cause for this may be found in the paucity of students here; for, with a very few exceptions, all monographs published in this country entail so large a pecuniary loss on their proprietors, that it can scarcely be a matter of surprise that they should be few in number and imperfect in execution. May we not, however, as authors, seek in ourselves a cause for this want of success? May we not fairly attribute the want of sale to the imperfection of our own handywork? Is it not notoriously the case, that when a painstaking man, who is master of his subject, undertakes such a monograph, that it is highly remunerative? As monographs, those

by Mr. Yarrell of our British birds and British fishes are most admirable; and when we see that second and enlarged editions of these works are called for, we have unquestionable evidence that the public does perceive and appreciate what is excellent: and we are half inclined to conclude that the want of encouragement of which we so loudly complain arises from our own negligence. Be this as it may, M. Bruand's 'Monograph of the Psychidæ' is one of the most elaborate and most perfect treatises that has ever issued from the press. The author minutely describes 82 species; he figures the perfect insects of these in every instance, and, in addition, gives 92 figures of larvæ, cases, and other details, and the neuration of 101 wings. To entomologists it is generally known that M. Bruand regards the Psychidæ as a section of the larger group, Tineina: this view has been flippantly disposed of in this country by expressions of unqualified dissent: this was to be expected from the superficial: one man goes into a field and counts the ears of corn, and when his arduous task is accomplished and the result declared, another, who has just peeped over the hedge, says "I don't agree with you." Again, one man who has devoted half a life to Greek, will talk of "glorious old Homer!" while another, who cannot decipher a Greek letter, "thinks nothing of the Iliad."

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

May 1, 1854.—H. T. STANTON, Esq., V.P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for May; by the Editor. The 'Athenæum' for April; by the Editor. The 'Literary Gazette' for April; by the Editor. The 'Journal of the Society of Arts' for April; by the Editor. The 'Proceedings of the Royal Society,' Vol. vii. No. 1; by the Society. The 'Proceedings of the Literary and Philosophical Society of Liverpool,' No. vii.; by the Society. 'Revue et Magasin de Zoologie,' 1854, No. 5; by the Editor, M. Guérin-Méneville. 'Généra des Coléoptères d'Europe,' par MM. Du Val et Migneaux, pties. 1 et 2; by the Authors.

Election of Members.

W. C. Dale, Esq., St. Pancras Vicarage, was elected a Member, and Messrs. Wallace and Bates were elected Corresponding Members of the Society.

Technical Trade Museum.

It was announced that the Council had resolved that the co-operation and aid of the Society should be given to the "Technical Trade Museum," now forming by the Society of Arts, under the direction of Mr. Solly; and that any duplicate specimens in the Society's collection, of insects beneficial or injurious to man, should be presented to it.

Exhibitions.

The Rev. Joseph Greene sent for exhibition a specimen of the rare *Notodonta Cucullina*, bred from a larva found on maple, and *N. trepida*, also reared; both larvæ having been taken at Halton, Bucks, last year.

Mr. Edwin Shepherd exhibited a pair of *Aleucis pictaria*, bred by a collector, who had no recollection of the larvæ.

Mr. Bond exhibited two bred specimens of *Anticlea Berberata*, of which the upper wings differed from each other in marking.

Mr. Douglas exhibited larvæ of *Elachista cerussella*, mining leaves of reeds, and larvæ of a new species of *Elachista* in leaves of *Poa aquatica*. These two kinds of larvæ are much alike; their manner of mining is somewhat similar, although in different plants; they had been considered to belong to one species (*Zool.* 4142), but the pupæ and perfect insects showed they were quite distinct; and Mr. D. proposed to call the new species *E. Poæ*.

Mr. Stevens exhibited a fine *Notodonta dictæoides*, and a pair of *N. Carmelita*, taken *in coitu*, the female of which was still laying eggs. These insects were captured on the 29th ult. at Shirwood Forest, where Mr. S. also took, under the bark of birch, *Hylecæus dermestoides*, larva, pupa, and imago; the larvæ he observed making transverse galleries in the alburnum. He also exhibited *Elater rufipennis*, *E. balteatus*, *E. crocatus*, *E. sanguineus*, *Ips 4-punctatus*, &c.

Mr. Stainton exhibited some shoots of ash, in which larvæ of *Prays Curtisellus* were burrowing beneath the bark; and stated that these larvæ when young, last October, had mined the leaves of the ash: a figure, by Mr. Wing, of the young mining larva, was also exhibited. Mr. S. observed that Guenée had said of this insect,—"Species incertæ sedis, donec larva latebit;" but he doubted whether the discovery of the larva and its singular habits would tend to remove this uncertainty, as no other larvæ were known to have a similar economy.

Mr. Stainton also exhibited some young shoots of the spindle-tree, which, as they grew, drooped in consequence of a minute larva feeding on the pith; these larvæ, however, soon leave the shoots, and spinning a few leaves together, feed thereon, thus almost reversing the order of things which takes place with *Prays Curtisellus*. He was at present unable to say to what species these larvæ belonged, but he strongly suspected they would produce *Hyponomeuta plumbellus*.

Mr. Stainton also exhibited a new *Lithocolletis* larva, discovered in Scotland by Mr. Scott, in the under side of the leaves of the bear-berry (*Arctostaphylos Uva-ursi*), which was especially interesting, as being another instance of the larvæ of this genus feeding on a low-growing plant.

Insects at Tunbridge Wells and Dover.

Mr. Curtis read the following list of insects found at Tunbridge Wells and Dover in 1852:—

"*Rhamphidia longirostris*, *Wied.*, July 6, two females on the borders of a pond in a copse; I could not find the male. The species has not been taken in England before, but it has occurred in Ireland, where also, in company with Mr. Haliday, on the damp and shady rocks on the shores of the Shannon, I took *Geranomyia unicolor*.

Thalyera sericea, *Sturm* (*Strongylus ferridus*, *Oliv.*), July 14, off shallows.

Mylæchus brunneus, *Lat.*, July 23.

Quedius ruftarsis, *Mars.*, August 2, on parsnip-flowers, Dover.

Latridius nodifer, *Westw.*, July 3, off a hedge.

Malachius marginellus, *Fab.*, July 30, by Ziczac, Dover.

Miarus Campanulæ, *Linn.*, July 14, in flowers of *Campanula rotundifolia*.

Coccinella ocellata, *Linn.*, July 21, under fir-trees, Eridge Park."

Entomologists treated as Trespassers.

The Secretary read a newspaper account of the committal to prison for trial of two poor working entomologists on a charge of setting fire to the furze on Putney Heath. It did not appear from the report that there was any proof that the act was committed by the men, and, as they justly stated, the fire would destroy the insects they sought. A conversation then arose respecting the difficulty experienced by collectors of insects arising from the illiberality of landed proprietors, and their encroachments upon the public right of way, of which some instances were adduced; and it was suggested, whether the Society might not in some degree mitigate the annoyance, by giving its Members a certificate that they were such, and that into woods and such-like places they went only in pursuit of insects.

Field-study of the Tineina.

Mr. Stainton laid on the table an invitation to such persons as wished to study the Natural History of the Tineina in the field, to meet at his house every Wednesday evening during the summer, and make an excursion in the neighbourhood.—*J. W. D.*

DUBLIN NATURAL HISTORY SOCIETY.

February 10, 1854.—Dr. GORDON, M.R.I.A., in the chair.

Donation.

Mr. Kinahan presented to the Society two volumes of Pennant's 'British Zoology,' interesting as containing original plates of discoveries in the Zoology of the British Isles.

Mr. Callwell, in proposing a vote of thanks for the donation, observed that works of such a class were valuable to the Society as records of the state of Zoology of that day, and as comparison with the present superiority of all works of the kind, and of the advanced state of scientific research. The works of Pennant, however, were well known for the accuracy of his inquiries.

Membranaceous Duck, Dusky Petrel, and Manx Shearwater.

Mr. Andrews then said that he had a few remarks to make relative to the paper brought forward on a former evening, on the capture of the membranaceous duck, in

Castlemain Bay, County of Kerry. He had since traced every circumstance fully confirmatory of its capture there; he regretted, however, that the windpipe or trachea had not been preserved, nor the sternum, which might have afforded additional interest to the observations. Apparently, the membranaceous duck would possess great power of flight, although its wings were extremely short, as in the Fuliginæ, the scaups or pochards, &c., whose powers of swimming and diving are great. Through the kindness of Dr. Farran, he had the opportunity of exhibiting and comparing fine specimens of the gadwall and of the shoveller duck. These beautiful birds, like the membranaceous duck, were remarkable in having the laminæ of the mandibles largely developed, and which were strongly so in the gadwall, a provision suiting them to their peculiar habits of feeding. The membranaceous duck, whose bill was extremely soft in its substance, seemed only suited to feed upon the softer Mollusca and gelatinous marine animals; thus the finely pectinated laminæ retain the minute creatures upon which the bird feeds, allowing only the watery portion to escape. In the paper before alluded to he had mentioned the capture, off the Island of Valentia, of the dusky petrel (*Puffinus obscurus*), and he was now, through the kindness of Mr. and Mrs. Blackburn, of Valentia, enabled to exhibit the specimen, which had been beautifully preserved. This bird, the *Puffinus assimilis* of Gould, a native of Norfolk Island and the eastern shores of Australia, is now first recorded as captured in Europe, never having been known north of the Mediterranean. It is, however, plentiful at the Cape of Good Hope, and probably on the north-west coast of Africa. The *Puffinus obscurus* is extremely like the Manx petrel (*Puffinus Anglorum*), but is readily distinguishable by its diminutive proportions, although sometimes the dusky petrel is a southern species, while the Manx petrel is a northern. Mr. Andrews had also the opportunity of exhibiting a specimen of the Manx shearwater, with the egg, taken in one of the cliffs on the Island of Valentia. These birds were always considered to breed on the Skellig Islands, but Mr. Andrews had never known the eggs to be obtained there. An egg had been sent to him taken from the smaller Skellig Island, and observed as belonging to a petrel, and stated to be that of the Manx shearwater, but on comparing it with the egg sent by Mr. Blackburn, it was of much smaller size, and not so oval as that of the egg of the Manx. On examination of the eggs in the British Museum, Mr. Andrews found one to correspond with it, and marked as the egg of Bulwer's petrel (*Thalassidroma Bulweri*). It was gratifying to have, so well authenticated by Mr. Blackburn, the egg of the Manx shearwater, as it was but little known to the naturalists of this country. The eggs of the petrels are large in proportion to the size of the birds, and it would be extremely interesting yet to prove that the egg of the petrel that had been sent to him was that of T. Bulweri. Having noticed such rare instances on the west coast, discovered within the last year, we may naturally expect to meet the other species of the petrels on that coast. The petrels on the south-west coast seemed principally to breed on the smaller Skellig Island, and on the Islands of Innismacalaun and Innisnabroe, two of the Basket Islands. In conclusion, Mr. Andrews could not but observe on the extreme interest of the birds exhibited this evening; two of the rarest additions to British Ornithology that had been made for years. The dusky petrel excited great interest when exhibited by Mr. Yarrell, at the Linnean Society, in June last; and this Society was much indebted to the kindness of Mr. and Mrs. Blackburn, of Valentia, in now affording the opportunity of seeing the specimen, and of that of the Manx shearwater. Living in a wild and remote retreat, Mr. and Mrs. Blackburn, with their daughter, devoted much of their

time to literary pursuits, and the two latter had, by their observations, gained and added much interesting information to the Zoology and Botany of that district.

Mr. Williams said, that he had long and great experience in watching the habits of water-fowl, and he did not consider that the shoveller had any peculiarity in its feeding; he observed it when swimming to skim the surface of the water with its bill, but to eat potatoes and meal in common with others of the duck tribe.

The Chairman remarked that the habits of birds in confinement could not be considered generally as the true mode of seeking and using food, as their wild state influenced them. They more commonly adapted their habits to the use of the artificial food supplied to them.

Mr. Andrews said that in the instance of a merganser, the strong serration of whose mandibles in the wild state enabled it to retain the fish it captured, the serrated character of the bill became blunt, and to some degree obliterated, by its change of food in confinement.

Mr. Kinahan was much interested in the remarks, particularly in that part where the breeding of the birds in the country had been confirmed. It was very undesirable to consider mere stragglers as natives. He had heard of the siskin breeding in summer in Powerscourt woods, also in Tipperary. Instances had been mentioned of the black-capped warbler and the redwing breeding there.

Reproduction and Distribution of the Smooth Newt.

Mr. Kinahan then read the following paper "On the Reproduction and Distribution of the Smooth Newt, and a Notice of the Popular Superstitions relating to it."

"Some years ago my attention was directed to these interesting animals, chiefly with reference to the number of species found in and about Dublin. I was then so fortunate as to have an opportunity of watching the progress of some of the earlier stages of development of our only Dublin species, the smooth newt (*Lissotriton punctatus*, Bell). Within the last few months my attention was again called to them by a very interesting and valuable paper by Mr. J. Higginbottom, of Nottingham, in the 'Annals' for December, 1853, [see Zool. 4243]. In this paper, which is stated to be the result of five years' close study, the author enters very fully into the habits and distinctions of the different species, corroborating for the most part the previous researches of Busconi in his 'Amours des Salamandres,' and of Professor Bell, in his excellent treatise on 'British Reptiles,' and also adding much to our knowledge by researches into what he calls their terrestrial stage. On reading this paper, I was struck with several discrepancies between Mr. Higginbottom's observations and my own. Whether this arose from his observations having been made solely on the warty newt (*Triton cristatus*), on which point there is some ambiguity in his paper, and mine on the smooth newt, or from some accidental cause, leaving others to decide, I shall content myself with detailing what I saw, and pointing out the discrepancies between the conclusions arrived at by Mr. Higginbottom and the results of my own experiments.

"On the 11th of May, 1851, I placed two smooth newts (*L. punctatus*), one a female, captured in the Bishop's Fields on the preceding day, the other a male, taken some ten days previously, in a glass jar, four inches in diameter, and about eighteen inches high; this was filled with water to within a few inches of its summit, and had floating in it a plant of the Indian pond-weed. On the 15th I found that the female had deposited half-a-dozen eggs; these were small, and made up of a round white body, about the size of a grain of mustard-seed (which it much resembled), floating

inside of a pellucid opal-coloured sac. During the two following days she deposited about a dozen more; they were arranged in strings of four to six, adhering in rows, and intertwined among the long floating roots, and also through the axils of the leaves, but in no instance could I find them deposited singly in the folded edges of the leaves, as Bell states, and Mr. Higginbottom asserts, is necessary for their preservation: Bell indeed states that they are sometimes placed in the axils of the leaves. The female, when depositing the ovum, wound her tail round the roots of the plant, as if to anchor herself. Of the ova produced, I distributed among my friends all but two; these I placed in a small bottle of water in a window facing the S.W., in a room of the temperature of from 60° to 70° F.; they were soon hatched, the one on the 3rd of June, the other on the 5th. This appears to contradict Mr. Higginbottom's statement, that the ova must be folded up in a leaf, and thus protected from the free access of the water, as these ova were hatched while lying at the bottom of the vessel, and had been knocking about for several hours in a small bottle in my pocket, previously to having been placed in the window. I do not mean to assert that the ova are not deposited also singly in the folded leaves, but merely that they are not necessarily so. The progress of their further metamorphosis has been so well described by Bell, that a lengthened description on my part were superfluous; suffice it to state, that the newts lived with me for fourteen days from the day they were hatched, and five weeks from their extrusion as ova; they then died, and at this period the most forward had the anterior extremities well formed, and the situation of the posterior marked by a protuberance on each side.

"With respect to fecundation, my experience with regard to this species goes to corroborate the opinion of Professor Bell, as opposed to that of Rusconi and others, including Mr. Higginbottom.

"With respect to its distribution, this species is found throughout this entire country, even at considerable elevations above the sea. I have found them near the summit of Howth, and in every quarry-hole among the Dublin and Wicklow mountains. It is known by various names: in its aquatic state as man-keepers, man-eaters, dark-lewkers, daddy-lewkers, and art-lewkers; and in its terrestrial stage as the dry ask and lizard. It is much earlier in awaking from its hibernation and seeking the water here than in the midland counties of England. I generally find them in the ponds in the Bishop's Fields about the second week in February. In other parts of Ireland they are pretty generally distributed: Thompson states, "occurring from North to South, but not generally distributed;" and in his Comparative List, he records it for Belfast, Dublin, and the West. There are numerous specimens of this species, obtained in the North, in the Ordnance Survey collection, now in the Museum of Irish Industry. I have obtained it in, or received specimens from, the following places:—North of Clare, rare; Tipperary North, scarce; South, common; King's County, Kildare, Wicklow, Wexford; Kilkenny, upon the authority of the Rev. J. Graves, who informs me it there goes by the name of dark lewker, which, he suggests, is derived either from *dearc*, a reptile, and *leucair*, brightness, that is, the shining reptile; or from *lewacrac*, a rush, that is, the reptile dwelling in rushy places: by this name it is known all over Ireland. It is also, I am informed, found in Louth and the Queen's County. It is omitted from the Catalogue of the Cork Cuvierian Society, and I searched for it unsuccessfully about Youghal and Ardmore, though I have reason to believe it is found in part, at least, of the County Waterford. Nulty, in his 'Natural History of Dublin,' mentions this animal among the quadrupeds, in its two

states, as distinct species : — 1. The dry ask, or man-keeper ; and 2. The water-ask, or arglogher, (the last manifestly the same word as dark lewker, which name, in some parts of the County Dublin, is pronounced art looker). He mentions, for the purpose of contradiction, two traditions connected with it as current in his time : — 1. That it is poisonous ; and, 2. That it can live in the midst of fire. With respect to the popular name, I find some of the lower orders call both the dry ask and the water-ask man-keeper or man-eater, while the names dark lewker &c. are restricted to the animal in its aquatic state. In Scotland, the animal is also called dearc luachrach in Gaelic.

" This brings me to the third part of my paper, namely, the superstitions connected with this animal. There are several of them curious and interesting, as having a connexion with the religious belief of the former inhabitants of this country, and are now fast dying away. In almost every part of the country we find these animals looked on with disgust and horror, if not with dread ; this arises from two superstitions : one of them, common to great part of Ireland, relating chiefly to the animal in its aquatic state, and which in the county of Dublin has earned for it the names of man-eater and man-keeper ; though the dry ask of the county of Dublin, that is, the animal in its terrestrial stage, is supposed to be equally guilty with the first-mentioned, in the habit of going down the throats of those people who are so silly as either to go to sleep in the fields with their mouths open, or to drink from the streams in which the dark lewkens harbour ; they are also said to be swallowed by the thirsty cattle : in consequence, the country people kill them wherever they meet with them on land, and poison the stream they are found in by putting lime into the cattle's drinking-pools. In either case the result is the same : the reptile taking up his quarters in the interior of his victim in some way, it would puzzle a physiologist to explain how, it contrives to live on the nutriment taken by the luckless individual or animal, so that, deprived of its nourishment, the latter pines away ; nay, so comfortable does the newt make herself, that not content with living by herself, she contrives to bring up a little family. Often have I been told of the man who got rid of a mamma newt and six young ones, by the following recipe, which I am assured is infallible : — The patient must abstain from all fluids for four-and-twenty hours, and eat only salt meats ; at the expiration of that time, being very thirsty, he must go and lie open-mouthed over a running stream, the noisier the better, when the newts, dying of thirst, and hearing the music of the water, cannot resist the temptation, but come forth to drink, and of course you take care they do not get back again. The dry ask, in addition to this bad character, is also supposed to be endowed with the power of the ' evil eye,' — children and cows exposed to its gaze wasting away. The Rev. J. Graves writes to me, that in Kilkenny it is looked on as ' a devil's beast,' and, as such, burnt. But to compensate in some measure for its evil qualities, the dry ask is said in Dublin to bear in it a charm. Any one desirous of the power of curing scalds or burns, has only to apply the tongue along the dry ask's belly to obtain the power of curing these ailments by a touch of that organ. In the Queen's County it is also used to cure disease, but in a different way ; being put into an iron pot under the patient's bed, it is said to effect a certain cure, though of what disease I am not quite clear.

" The warty newt (*Triton cristatus*) rests solely on Mr. Templeton's authority. It is an inhabitant of every part of England, and might naturally have been expected to be found in Ireland ; it may yet perhaps be met with in the western wilds, where Mr. Thompson has, from description, recorded the palmated newt (*Lissotriton palmipes*), which has been found both in England and Scotland. It is recorded in the Catalogue

of your Museum, but of the locality where it is said to be obtained, I cannot find any record.

"Other points of interest relating to the economy of these animals, many of them bearing on Mr. Higginbottom's paper, I hope to lay before you at some future period, when I have made further experiments."

TYNESIDE NATURALISTS' FIELD CLUB.

Anniversary Meeting, March 15, 1854. — SIR W. C. TREVELYAN, Bart., in the chair.

The President, on retiring from office, read to the Members a highly interesting Address, recommending to them the study of the fossil Infusoria, and the microscopical examination of coal. He exhibited a fossil pearl, of the size of a small marble, and which in appearance it much resembled.

Some additions to the insect Fauna were communicated by Mr. T. J. Bold, who also read a paper, intitled "Notes on the Effects of the extreme wet Winter of 1852-3 on Insects." From this paper we learn that the immense swarms of "cholera-flies" which were seen in Newcastle and the vicinity last autumn, were winged Aphides; the greater number consisting of *Aphis Rumicis*, with a sprinkling (perhaps one in a thousand) of *A. Brassicæ*. The former had previously been noticed to infest fields of beans, and the latter, turnips.

Mr. D. Oliver, jun., communicated some interesting botanical notes, and exhibited some fine specimens of rare plants collected at the field meeting held in Teesdale in July last.

Mr. Storey, the Secretary, announced that he hoped to have the first part of his 'Flora of Northumberland and Durham' ready for distribution to the Members before the next Anniversary.

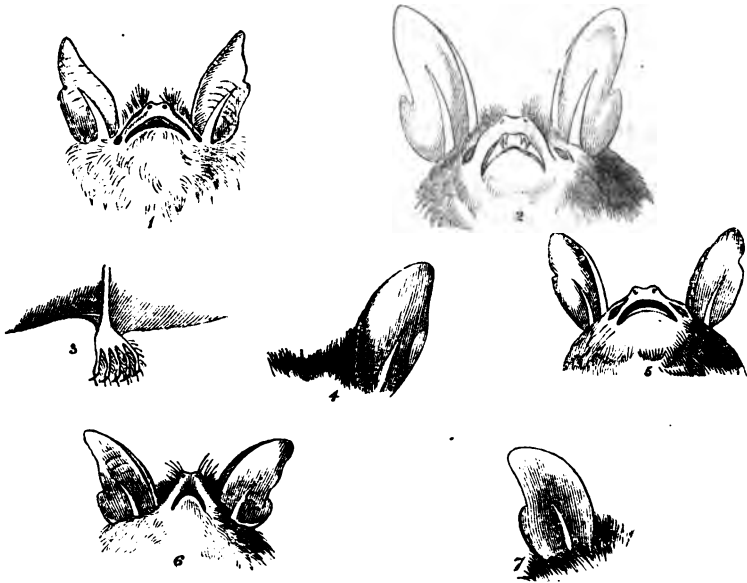
Mr. Storey also called the attention of the meeting to an isolated boulder stone, bearing strong marks of glacial or diluvial action, which he had observed lying partially exposed in a field on the Elswick estate, between South Parade and Scotswood Road.

The places selected for the field meetings of the ensuing season are Dilston, Brinkburn Priory, Lindisfarne, Castle Eden, Northumberland Lakes, and Alnwick. It is also intended to hold a subterranean meeting in one of the coal-mines of the Tyne or Wear.

The following gentlemen were elected Officers for the year ending February, 1855.
President :—Thos. Sopwith, F.R.S. *Vice-Presidents* :—Sir W. C. Trevelyan, Bart., Wm. Kell, Dr. Embleton, Joshua Alder, Jos. Fryer, and Ralph Carr. *Treasurer* :—Thos. Burnett. *Secretaries* :—John Storey, F.B.S.E., and Edward Mather. *Committee* :—Rev. G. C. Abbs, Albany Hancock, John Thompson, T. J. Bold, R. Y. Green, Rev. Wm. Greenwell, Richard Howse, Joseph Blacklock, John Storey, jun., Wm. Sidney Gibson, F. J. Peck, and D. W. Oliver, jun. The under-mentioned gentlemen were elected Members of the Club :—Messrs. R. W. Bleasby, C. Crighton, Wm. Green, jun., D. H. Goddard, and Cuthbert E. Ellison, Esq.—T. J. B.

Critical Observations on the Notch-eared Bat.

By R. F. TOMES, Esq.



1. From Geoffroy. 2. From Cocks. 3 and 4. From De Selys Longchamps.
5. From Bonaparte 6. From one of my own specimens taken in Warwickshire.
7. From one of the specimens in the collection of M. Verreaux.

SEVERAL records having lately appeared of the occurrence of the notch-eared bat (*Vespertilio emarginatus*), a somewhat doubtful species, and having paid some attention to this order of Mammalia and collected some specimens of the so-called species, I am induced to collect together as much of its history as lies within my reach, hoping that it may prove useful to any collector who may have the fortune to obtain examples for investigation.

The first notice is by Geoffroy St. Hilaire, in the eighth volume of the 'Annales du Museum d'Histoire Naturelle,' accompanied by a figure of the entire animal, of the head and of the skull. The description is exceedingly meagre, and no dimensions are given, but the figure is stated to be of the size of Nature.

M. Geoffroy examined specimens from Abbeville, from the fortifi-

cations at Charlemont, and one specimen taken by Brongniart near Dover. The date of the time containing this account is 1806, and I am unaware of any other until 1820, when the 'Mammalogie' of Desmarest made its appearance, but without adding anything new to our knowledge of the species.

The next account we have appears to be that of Millet, in his 'Faune de la Maine et Loire,' in 1828, and, from the way in which he speaks, it must be supposed that he had examined specimens, as his description is much fuller than either of the two preceding him; indeed he distinctly mentions having met with it in the month of June "dans un des appartimens de la Baumette; très rare."

In the same year Dr. Fleming brought out his 'British Animals,' and, although he alludes to it as occurring in Fife, it is pretty evident from his remarks that he was unacquainted with the species, for he writes of its being "apt to be confounded" with *M. murinus*,—the largest European species, whilst *V. emarginatus* is one of the smallest.

The 'Synopsis Mammalium' of Fischer appeared the following year (1829), but he adds nothing to our store of knowledge on the subject, except that he refers to Kuhl's 'Beytrage zur Zoologie,' and to the MSS. of Leisler, neither of which authorities I am able to consult.

A good figure of what is supposed to be the *V. emarginatus* is given in the 'Fauna Italica' of the Prince of Canino, as also a figure of the skull, and both are exceedingly accurate representations of *V. Nattereri*, to which species the whole account is referred by MM. Keyserling and Blasius, in their work to be hereafter mentioned.

Two years after the date of the 'Fauna Italica,' the valuable monograph of the *Vespertiliones* by Temminck made its appearance (1835), but his figure is evidently a copy from that given in the first instance by Geoffroy,—a circumstance most remarkable, when we find that he says there are specimens in the Museums of Paris and the Low Countries.

The *V. emarginatus* of the 'British Vertebrate Animals,' by the Rev. Leonard Jenyns, which bears date the same year, is obviously the *V. Daubentonii* of other writers on Mammalia,—a fact he himself states to be the case in the 'Annals and Magazine of Natural History.'

In 1836 M. Hollandre published his 'Faune de la Moselle,' in which he mentions that the species was not rare in 1822-3, and that

he took considerable numbers at that time in some vaults under a mill, where, he goes on to remark, it passes the winter.

After this comes the account given by Professor Bell, in his 'History of British Mammalia,' taken from the original notice by Geoffroy, with the observation that it is far from probable that it may prove to be identical with the *V. Daubentonii*; but a skull of the latter, compared with the figure of that part in the plate to the first notice of the *V. emarginatus*, does not at all bear out this opinion. The figures given by Professor Bell are good copies from Geoffroy.

Proceeding chronologically, I come to a very detailed description by the late Professor Macgillivray, in the volume of the 'Naturalists' Library' dedicated to the History of British Quadrupeds, from a specimen he had received from Winchester; but he appears, at the time of the publication of that work, not to have been aware that any other description had been given, except those of Geoffroy and Desmarest.

During the following year (1839) appeared the valuable 'Etudes de Micro-Mammalogie' of Baron de Selys Longchamps, at the end of which work is appended a methodical catalogue of all the European Mammalia, with their synonyms, distribution, &c.: in this he includes the *V. emarginatus*, and gives France, Germany and Italy as countries where it is found, but omits England.

In the year 1840 MM. Keyserling and Blasius published the first part of their work on European Vertebrata, 'Die Wirbeltheire Europas,' in which they refer the *V. emarginatus* of Geoffroy, Temminck and Macgillivray, to *V. mystacinus*, and the *V. emarginatus* of Bonaparte to *V. Nattereri*.

During this year the first volume of Wagner's continuation of Schreber's great work on Mammalia made its appearance, and in the classified index this species is included as a doubtful one, but is entirely omitted in the body of the work.

The next notice I find is in the 'Faune Belge' of Baron de Selys Longchamps, published in 1842. The author mentions having met with it in the quarries at Mæstrecht, where it passes the winter in the roof of the Château de Vogelsanck, near to Hassell, and that it has been found by M. Van Beneden at Lovain. De Selys appears to feel quite sure that it is a perfectly distinct species, for after speaking of the localities where it is found, he proceeds:—"It is singular that MM. Keyserling and Blasius confound it with *V. mystacinus*; it more nearly resembles *V. Nattereri*; but it is distinct from these species by

its woolly fur, pale red on the back and extending markedly on the interfemoral membrane, by its ears being very much emarginated, its thick muzzle, &c. The colour of the emarginatus is nearly that of the Serotinus." At page 300 of the same work are some additions, among which the following occurs:—"Relatively to the Vesp. emarginatus, MM. Keyserling and Blasius have fallen into three remarkable errors: 1st, they consider that of Jenyns to be *V. Daubentonii*; 2nd, that of Geoffroy to be *V. mystacinus*; 3rd, they think that of Temminck is a copy, a little altered, of the figure given by Geoffroy, &c. I have proof that these assertions are incorrect. The emarginatus is as distinct from our other Vespertiliones as the *Arvicola subterraneus* is from our other Campagnols." At the end of the work a plate is given of the ears and feet of several European species of bats, amongst which are *V. Nattereti*, *V. mystacinus* and *V. emarginatus*; and unless the figures are exceedingly incorrect, the latter species must differ materially from the other two, but certainly bears the greatest resemblance to the first of these in the form of the ear, with the lobe folded inwards, as in that figure. But the author is evidently incorrect in some of these remarks, and MM. Keyserling and Blasius are right; for instance, the *V. emarginatus* of Jenyns is admitted by that gentleman himself to be referrible to some other species, probably *V. Daubentonii*; and again, a very slight inspection of Temminck's figure with that of Geoffroy will convince any one that the former is copied from the latter.

In 1848, having met with two specimens of bats that I was unable to refer to any of the known British species, except it were the description of the present one as described by Prof. Bell, I examined the account given by the first describer, and also that by Prof. Macgillivray already alluded to, and gave a short notice to the Zoological Society, which was published in the 'Proceedings' of that year, and again in the 'Annals and Magazine of Natural History' for August, the following year.

The next reference to this species that I met with is by Mr. Cocks, in the November number of the 'Naturalist' for 1851, accompanied by a short description and a figure of the head and ears, which, I may remark, differs from every other figure I have seen. Then comes the notice by Mr. Couch in the 'Zoologist'; and, finally, some observations by G. B. Bucton, Esq., F.L.S., to the Linnean Society, in December, 1853. In the latter paper the author treats the species as a variety of *V. Daubentonii*, and from his description the specimens

he has met with cannot be identical with the species described by other writers on the subject,—*e. g.*, supposing the specimens examined by Mr. Bucton to closely resemble *V. Daubentonii*, in the latter the wing-membranes are only attached as far as to the ankle, whilst in the figure given by Baron de Selys Longchamps of the *V. emarginatus* they are attached as far as to the base of the toes, a character which has been considered by Mr. Gray of sufficient importance to be entitled to generic distinction.

Should this paper meet the eye of Mr. Bucton, will he allow me to suggest the possibility of his having met with the *V. dasyncnemus* of continental writers—the *V. lymnophilus* of Temminck?

The species may be known from *V. Daubentonii* by being somewhat larger, grayer in colour, and with the feet still less engaged in the membranes. I am not aware that it has been recorded as having occurred in Great Britain, although it is common on many parts of the Continent.

Since writing the above it has occurred to me that at the time Prof. Fleming wrote his 'British Animals,' our common little bat *V. pipistrellus* was called *V. murinus*; and hence his remark, that the *V. emarginatus* might be confounded with it, is not so unlikely as at first appears,—but even in this case it must be a very ordinary observer who would confound the two, if they had specimens to examine. In the *V. emarginatus* the tragus is elongated and pointed; in the *V. pipistrellus* it is blunt. The first is a true *Vespertilio*; the latter is included in the *Scotophilus* of Leach.

It would be occupying space unnecessarily were I to give the descriptions of all these authors, particularly as some of them are merely copies of each other: I propose, therefore, giving in the first place a condensed description from the original one, with dimensions from the figure, and then from such others as appear to have been taken from specimens, and which appear to offer any remarkable points of difference.

GEOFFROY.—Ears oblong, of the length of the head, and notched at their outer edge. Tragus subulate. Above reddish gray, below ash-coloured. Fur bicoloured, the reddish gray occupying half the length of the hair. Tips of the hairs of the belly dirty white.

The figure of the skull is of exactly the same dimensions and proportions as the skull of *V. mystacinus*.

MILLET.—Ears oblong-oval, somewhat longer than the head, and notched at their external margin, with an external lobe reaching to about half their length, which is folded inwards in a state of repose. Tragus subulate, reaching to the notch of the ear. Feet hairy on their outer surface.

Above reddish gray, below paler; the hairs of the back long and soft to the touch, brown for their first half and pale reddish ash at their extremity.

TEMMINCK.—Form and size much as in *V. mystacinus*, with which it may be readily confounded.

Outer margin of the ears dilated into a distinct lobe, marked by a longitudinal crease or plait. Upper surface of the ears covered with scattered hairs, at the base very hairy. Above, all the parts of a rufous tint more or less bright, tinged with yellowish and brown. Hairs brown at their base, then yellowish and terminated with rufous. Below ash-coloured, slightly tinged with rufous, particularly the parts above the humerus. Membranes dirty brown.

M. Temminck commends the figures of Geoffroy and Bonaparte as being exact, but there is very little resemblance between them, more especially the crania.

MACGILLIVRAY.—Muzzle of moderate length and slightly emarginate between the nostrils. Ears as long as the head, widely separated, ovate-obtuse, but outwards, their inner margin convex, the outer with a semicircular lobe at the base, and a wide and deep sinus in their upper half. Viewed without reference to the basal lobe, they might be described as oblong, but otherwise they are broadly ovate and deeply emarginate. Tragus subulate, more than half the length of the ear. Membranes bare. Tail extending half a line beyond the interfemoral membrane. Cutaneous system dusky. Fur long, close, and very soft, inclining to silky. A series of long, soft, mystacial hairs on each side of the upper jaw, and a few project from the chin.

General colour very light reddish brown, inclining to gray on the upper parts, and grayish white tinged with brown on the lower; but the basal portion of the fur above and below is dark brown.

My own specimens before alluded to agree so closely with the above description that I refrain from giving any further account, ex-

cept to remark that the wing-membranes spring from the base of the toes, as in *V. mystacinus*, which character is not mentioned by the Professor.

COCKS.—No. 1. Ears erect and deeply notched on the outer edge. Tragus long, styliform. Fur chestnut-brown on the back and sides, paler beneath.

No. 2. Ears notched on the outer edge, but not so deeply as in No. 1. Fur on the back and sides light reddish brown, abdominal and inguinal regions whitish.

BUCTON.—Ears somewhat narrower and more deeply notched (than in *V. Daubentonii*). The thumb stouter, and with reference to the size of the bat not so long. Fur more of an ash-gray, and the flying membranes and fur of the under side more cool in colour.

The last two columns in the following table of dimensions refer—the first to *V. mystacinus* and the other to *V. Nattereri*, from specimens in my own collection, and taken when fresh. The others, to descriptions of *V. emarginatus* by various authors.

	<i>Geoffroy.</i>	<i>Desmar.</i>	<i>Millet.</i>	<i>Temm.</i>	<i>Macgil.</i>	<i>Cocks.</i>	<i>Cocks.</i>	<i>Bucton.</i>		
Head and body	2 3	2 1½	1 11½	1 11	1 11	2 4½	1 9	3 7½	1 7½	1 11
Tail	. 1 3	1 4	1 4	1 3	1 4	0 10½	0 8½	1 5	1 5	1 5
Ears	. 0 6½	....	0 3½	....	0 5	....	....	....	0 6	0 7
Tragus	. ....	....	....	....	....	....	....	....	0 3½	0 5
Expanse	. 10 6	9 7	9 7	10 2½	9 6	9 0	8 6	10 3	....	10 8
Fore arm	. ....	....	....	1 6½	1 5½	....	....	1 7½	1 3	1 5½
Humerus	. ....	....	....	1 0	0 9½	....	....	....	....	0 11
Thumb	. ....	....	....	....	0 2	....	....	0 5	....	0 2½
2nd Finger	. ....	....	....	....	1 4½	....	....	....	....	....
3rd Finger	. ....	....	....	....	2 3	....	....	....	....	2 7
4th Finger	. ....	....	....	....	1 10½	....	....	....	....	....
5th Finger	. ....	....	....	....	1 9½	....	....	....	....	....
Thigh	. ....	....	....	....	0 6	....	....	....	....	0 6½
Leg	. ....	....	....	....	0 7½	....	....	....	....	0 7½

The following descriptions are taken from two specimens of a species of *Vespertilio* which I received from Paris from M. Verreaux, labelled "*V. emarginatus*, Europe." They were along with specimens of other European species, such as *V. murinus*, *V. Noctula*, *V. pipistrellus*, *V. Kuhlii*, *V. Wilsonii*, &c.; and, from the peculiar manner in which all were preserved, I have no doubt that all were done by the same hand, and all correctly labelled. If such is the case, the specimens to which I allude cannot be referred to any species except *V.*

emarginatus, and they agree very closely with the remarks of Baron de Selys Longchamps, in his 'Faune Belge.'

Male, probably adult.—Muzzle somewhat elongated, but tumid; space around the eyes nearly naked; fur of the forehead very thick and extending to near the end of the nose; lips with a distinct *moustache*. Tragus very much attenuated near its extremity, reaching nearly to the notch in the margin of the ear, and bent outwards near the tip. Emargination of the ear not very deep, but clearly and well defined, about the middle of its length. Interfemoral membrane with about ten regular transverse lines, and the fur of the back extending on it for about half an inch, and down the legs to near the heel-bone. Wing-membranes taking their origin from the base of the toes. Upper parts pale bright cinnamon-brown, palest on the head, the hairs being brown at their base for a third of their length, then yellowish buff and tipped with pale red. Below of a rich cream-colour, darkest near the humerus, each hair being dusky brown at the base for half its length, the remainder cream-coloured. Fur exceedingly thick and soft. Membranes light reddish brown.

The second specimen is a female, and agrees exactly with the above in all respects, except colour; the hair of the upper part being dark at its base, tipped with umber-brown; beneath dark at the base, tipped with grey-brown. Membranes dark brown.

	No. 1.	No. 2.
	in. lin.	in. lin.
Head and body	about 2 9	2 8 about
Tail	1 3	1 2
Head	0 8½	0 9
Ears	0 6½	0 6½
Tragus	0 4	0 3½
Fore arm	1 5½	1 5
From carpus to tip of wing	2 7	2 5½
Thumb	0 2½	0 3
Leg	0 8	0 9
Foot	0 4	0 4
Expanse	about 10 0	9 6 about.

From an inspection of these descriptions and figures, which I have given in as condensed a form as is consistent with anything like clearness, it cannot, I think, be doubted that some of them are exceedingly incorrect, or that more than one species is described. I incline to the latter opinion, and am doubtful whether the *V. emarginatus* of British naturalists must not be referred either to *V. mysta-*

cinus, *V. Nattereri* æ: *V. Daubentonii*. My own specimens are most like the first of these, but differ remarkably in colour, and, as I once thought, in the form of the ear; but I have recently received some specimens of *V. mystacinus*, which were collected in Southern Russia, which have the same kind of emargination to the ear; and with regard to the colour, I have since had an opportunity of examining two females of *Vespertilio Leisleri*, containing each a foetus, and these were of an unusual pale reddish colour. All the specimens of the so-called *V. emarginatus* I have captured have been females, containing a single foetus. Prof. Macgillivray's description is so full that I have no hesitation in saying his specimen was of the same species as mine.

From the decided tone of the remarks made by Baron de Selys Longchamps, and from the figures he gives to elucidate the European species, we feel bound to believe that the species he speaks of is a perfectly good one; at any rate we cannot have a higher authority for such an opinion.

Before concluding I wish to call attention to what is really an emarginated ear, and what is in reality only an appearance of such. The ears of many species of bats are entire in their outline while in a fresh condition, as in the *Nattereri*, but there is a certain portion of the outer margin which is more membranous and less cartilaginous than the rest, and this in drying occasions an indentation or notch, which is evidently the case in the specimen represented by the Prince of Canino: this, by simply moistening the ear, may at once be removed, and the original form restored; but in the specimens I received from the Continent the notch is caused by the growth of a well-developed rounded lobe at the base of the ear, and such is evidently the case with the specimen from which the author of the 'Faune Belge' took his figure.

Should any of the readers of the 'Zoologist' meet with specimens of *Vespertilionidæ* which they feel doubt about identifying, I would respectfully solicit the opportunity of examining them, and would undertake their safe return to the owner.

ROBERT F. TOMES.

Welford, near Stratford-on-Avon,

June 14, 1854.

Remarks on a List of the Birds of West Cumberland.—Will your correspondent, Mr. Buchanan, allow me to make a few inquiries respecting some extraordinary statements in "A List of the Birds of West Cumberland," communicated by him to the 'Zoologist' (Zool. 4166)? I have delayed doing this till now, hoping that some one more competent than myself would have called attention to them sooner. I am sure I am only expressing a desire which must be felt by every ornithologist in asking Mr. Joseph Robson to favour the readers of the 'Zoologist' with some more information concerning the swallow-tailed kite which he states was shot in Eskdale, in the spring of 1853; this peculiarly American bird having, as far as I am aware, been taken only twice before on this side the Atlantic,—on one occasion fifty, and the other eighty, years ago (letting alone the fact that in the former case the bird, not having been killed, subsequently escaped from its captor, while in the latter naturalists have long lost sight of the identical specimen),—makes its occurrence here a third time very interesting, and I think justifies my asking for the following particulars:—1. A detailed description of the specimen said to have been killed in Cumberland. 2. The exact date of its occurrence. 3. The name and address of the person who shot it, and of its present possessor. 4. And some details of the circumstances under which it was obtained. The crested tit apparently is considered in the same light as the other tits; and the alpine accentor, with "Cold Fell, &c." as its localities, appears not to be thought much of in this fortunate county of Cumberland; as also, the little ring plover, spotted sandpiper, little and masked gull, which are rare enough in this part of the country, though they are stated to be "common" in Cumberland. However, should these birds, which are scarce in other parts of England, be "common" in Cumberland, surely Mr. J. Robson may expect a rush of ornithologists from all parts of the kingdom, each one endeavouring to obtain specimens of these birds for himself.—Robert Birkbeck; Keswick, Norwich, June 8, 1854.

Occurrence of the Hoopoe and Oriole near Blandford.—A fine specimen of the Hoopoe (*Upupa Epops*) was shot a short time back at Organ Ford, near Wareham, by the gamekeeper of J. Oldham, Esq., and is now being stuffed by Mr. Hart, of Christchurch. Also, in the garden at the rectory in this parish, a golden oriole (*Oriolus Galbula*), was, about three weeks back, seen constantly during more than a week, by the gardener, who described it to me as "about the size of a thrush, and of a bright yellow, with black on the sides." He also said, "that it was by no means shy, but hopped about on the newly dug ground, apparently picking up worms and insects." I have watched there several times since, but have not been able to catch a sight of it myself; still as the place is immediately contiguous to a large extent of orcharding, I have every hope that it may be peacefully undergoing the cares of a family, in one of the numerous apple trees apparently well suited for the purpose; for I do not imagine the male bird (which I conclude was the one the gardener observed) would stay so long a time as a week on the same spot, except accompanied by its mate, which the gardener would probably not have noticed, it being so very sober in plumage compared with the male.—Octavius Pickard-Cambridge; Bloxworth House, Blandford, June 8, 1854.

Occurrence of the Little Bittern and other Rare Birds in Surrey.—I beg to record a little bittern shot in the neighbourhood of Guildford, in Surrey, and now at Mr. Mansell's, Farnham, to be preserved. It is a female, in good condition, and with eggs in her when killed. I take this opportunity of enclosing a list of rare birds obtained

in this neighbourhood within the last few years, and for so inland a locality it is by no means a poor bill of fare.

The Osprey. Milford House, Godalming.

Dartford Warbler. Farnham. In my own collection.

Bohemian Waxwing. Farnham. In my own collection.

Hoopoe. Frensham, near Farnham. In my own collection.

Dotterell. Farnham. In my own collection.

White Spoonbill. Frensham Pond. In my own collection.

Curlew. Frensham Pond. In my own collection.

Eared Grebe. Male, in summer plumage. Frensham Pond. In my own collection.

Gannet. An adult bird. Frensham Pond. In my own collection.

Little Bittern. Now added to the list.

This list is only of those that have come under my own observation. There may be many more to be recorded. I can add to these, as less rare:—

Hen Harrier. Male and female. In my own collection.

Long-eared owl. In my own collection.

Short-eared owl. In my own collection.

Great Gray Shrike.

Hooded Crow.

Ring Ouzel.

Gray Phalarope. In my own collection.

Sanderling. In my own collection.

Tufted Duck.

Scap Duck.

Common Scoter.

I may add that a nest of woodcocks was hatched out last year close to my house.

—*John W. G. Spicer; Willey House, Farnham, Surrey, June 12, 1854.*

Waterhen carrying her Young in her Feet.—A waterhen has built her nest in the branch of a fir tree which overhangs the river, a few feet above the water. She was seen yesterday to fly down with two of her young brood, one in each foot, from the nest.—*Samuel Gurney, jun.; Carshalton, June 9, 1854.*

Occurrence of the Bee-eater in Norfolk.—About the 3rd of this month a pair of these rare and beautiful birds were shot on the river between Norwich and Yarmouth. I had the pleasure of seeing them in the flesh, and for brilliancy of plumage I never saw finer specimens. Both birds were in good condition; and on dissecting the stomach of the female I found the remains of no less than five large insects of the Hymenopterous order, apparently the wild or humble bee species; the stomach of the male also contained similar débris, but less distinguishable. The ovary in the female appeared on examination not to contain any eggs in a perceptibly advanced stage, which may probably indicate that the bird had already deposited her quota of eggs for this season, whilst the thinness of feathers on the breast seemed suggestive of her having been sitting.—*H. Stevenson; Norwich, June 16, 1844.*

A List of Marine Animals obtained at Weymouth.

By P. H. GOSSE, Esq.

As a large number of marine animals passed through my hands in the course of the summer of 1853, I have thought that an enumeration of such as are not common to almost every locality might be interesting to naturalists. Local Faunas are not without value, especially to a right understanding of the geographical distribution of animals, and the external conditions which regulate their presence or absence. But besides this, the following list will present some examples of animals of rarity, the record of whose capture is always valuable; and may afford hints to collectors where to find some species, which, though considered *scarce*, are rather *local*. I shall not deem it necessary to mention such animals as the cod and the mackerel, the crab and the lobster, which are taken in abundance for the market; nor shall I put down any species, though I may know of its occurrence in the locality, which has not come into my own possession.

Weymouth, and its immediate neighbourhood, was the scene of my researches. A few species from deep water were procured by the Weymouth trawlers, who extend their search into West Bay; hence I cannot be quite sure whether such specimens were obtained on the east or the west side of Portland. The overwhelming majority, however, were taken within a line extending from Lulworth to Portland Breakwater.

Fishes.

Trachinus vipera. Commonly hauled in seines, on sandy beaches.

Aspidophorus cataphractus. Not rare, around the quays.

Labrax lupus. Common in the harbour.

Cottus bubalis. Abundant.

Gasterosteus spinachia. Abundant around the quays.

„ *semi-armatus*, *G. trachurus*, and *G. leiurus*. Common in the backwater.

Atherina presbyter. Common in the harbour.

Mugil capito. Common in the harbour.

Blennius pholis. Abundant in tide-pools, on ledges.

„ *ocellaris*. Frequent off Preston, in autumn.

„ *gattorugine*. Common.

„ *Yarrellii*. One specimen in July.

„ *Montagui*. One specimen in July; dredged.

Murænoides guttata. Common around the quays.

- Gobius albus*. Frequent in summer, off shore.
 „ *niger*. Abundant in tide-pools.
 „ *unipunctatus*. Abundant in the Fleet-water.
 „ *minutus*. Dredged occasionally.
 „ *Ruthersparri*. Common in the keel-drag.
Callionymus dracunculus. Common in the Bay.
Labrus bergylta. Abundant; brilliant specimens, and some of large size, occur frequently in various parts of the Bay.
 „ *Donovani*. Quite common in the harbour.
 „ *mixtus*. One small specimen.
Crenilabrus Cornubicus. Very abundant around the quays.
 „ *melops*. Common, in summer and autumn.
 „ *rupestris*. Common, in summer and autumn.
 „ *pusillus* (?) One specimen.
Motella vulgaris. Not rare.
 „ *quinque-cirrata*. Common.
 „ *glauca*. This very rare and very minute fish (the mackerel midge) I obtained on the 8th of July, by dredging.
Platessa microcephala. Several specimens.
Solea pegusa. Two specimens, in July.
Monochirus linguatulus. Common.
Rhombus punctatus. A fine specimen of this very scarce little fish (Bloch's top-knot) was brought to me by a trawler, in August.
Lepidogaster bimaculatus. Frequently dredged in summer.
Ammodytes Tobianus and *A. lancea*. Commonly taken when the seine is hauled upon the sandy beaches.
Syngnathus acus, *S. typhle*, *S. æquoreus*, *S. anguineus*, *S. ophidion*, and *S. lumbriciformis*. The whole of the British pipe-fishes are quite common in Weymouth Bay, chiefly on the *Zostera*-beds, from low-water-mark to deep water. *S. typhle* and *S. æquoreus* are especially abundant.
Raia microcellata. Three specimens of this beautiful ray I took, together with the following species, with a small trawl, in shallow water, off Smallmouth Sands, at the end of June. Young specimens of *R. clavata*, beautifully ocellated, were also taken.
Raia marginata. See preceding note.

P. H. GOSSE.

58, Huntingdon Street, Barnsbury Park.

(To be continued.)

Note on the Dorsal Ciliary Fibres of the Five-bearded Rockling.—Those readers of the 'Zoologist' whose attention has been turned to Ichthyology are doubtless aware that the five-bearded rockling is one of the commonest of those species of fish which frequent the rocky parts of our coast, and are to be obtained among the stones and sea-weeds in the pools of water left by the receding tide: they will also recollect that this fish is not only furnished with the five fleshy barbules around the mouth, from which it derives its name, but also with a similar barbule, of a somewhat stiffer texture, which is planted on the nape of the neck, between the roots of the pectoral fins. In the space intervening between this barbule (which is ordinarily kept in an erect position) and the dorsal fin, there is a furrow-like depression reaching from the barbule to the fin, all along the bottom of which is arranged a single close-set row of minute ciliary fibres, which are constantly to be seen in rapid vibratory motion, the movement extending throughout the whole of the row, and often continuing for a considerable period, especially (as far as my observation goes) when the fish is at rest after having been disturbed, though whether it only happens then I cannot say, but I think it never occurs when the fish is in motion. As I write from the sea coast, and have no books of reference by me, I am unable to say whether this peculiarity has been noticed by ichthyologists, but it appears to me to be a curious habit, and one which it would, if possible, be interesting to investigate and to explain. I therefore beg to call to the subject the attention of naturalists residing on the coast.—*J. H. Gurney; May 22, 1854.*

Abundance of the Larva of Lasiocampa Trifolii.—The larva of the above-named species has been exceedingly plentiful here this season, myself and two friends having taken nearly one hundred in the course of a few days' collecting. The cliffs adjoining Bovisand and Whitsand Bay were the most productive localities.—*W. H. Hayward; Devonport, Devon, June 16, 1854.*

List of Eupithecia, &c., reared from Larvæ.—I have lately bred the following Eupitheciæ:—

Eupithecia piperaria. From larvæ on *Gentiana campestris*, in August and September. Six.

- " *fagicolaria.* From ditto ditto. Thirteen.
- " *innotaria.* I believe from larva on hazel, in September. One.
- " *minutaria.* From larva on nettle, in September. One.
- " *tenuiaria.* From larva on wild thyme, in July. One.
- " *ruffasciaria.* From pupæ under oak, in August. Two.

I have also bred from larvæ taken last year:—

- Geometra illustraria.* From larva on hazel, in September. One.
- Ephyra undularia.* From larva on willow, in October. One.
- " *omicronaria.* From larva on beech, in September. One.
- Xerene adustaria.* From larva on maple, in September. One.
- Eurymene dolabraria.* From larvæ on beech, in September. Three.
- Boarmia consonaria.* From larva on beech, in September. One.
- Numeria pulveraria.* From larvæ on hazel, August and September. Seventeen.
- Abraxas ulmaria.* From larvæ on wych elm, in September. Sixteen.

I was fortunate enough to find bred specimens of *Notodonta ziczac* and *N. cucullina* paired in my cage, a short time since. The females both laid eggs, which are already hatched, and the young larvæ feeding well.—*H. Harpur Crewe*; 17, *Cavendish Road, St. John's Wood, June 8, 1854.*

List of Syrphidæ taken near Putney.—Notwithstanding the paucity of communications respecting Diptera, in the 'Zoologist,' I am induced to hope that the following list of rather uncommon species of Syrphidæ, taken (with one exception) in this neighbourhood, during the late spring, may not be unacceptable to some of its readers. My attention has been directed almost exclusively to the Syrphidæ, or the list might perhaps be indefinitely extended.

Cheilosia flavipes. Beginning of April. Wimbledon Common.

Syrphus luniger. April 15 to May 20. River-bank; also at Weybridge.

Cheilosia albitarsis. May 9. Wimbledon Park, and elsewhere.

Syrphus grossulariæ. May 9. Wimbledon Park; also at Weybridge.

Ascia dispar. May 10. River-bank.

Syrphus tricinctus. May 12. Weybridge.

Doros citrofasciatus and *ornatus.* May 17. River-bank.

Cheilosia means and *chlorus.* May 23. Wimbledon Park.

Merodon clavipes. May 31. Of this rare insect I have at present but one specimen (fem.), taken in a market garden off cabbage-bloom.

I have also been fortunate enough to capture two species apparently new to the British list (a species of *Syrphus* and an *Ascia*), neither of which I have been able at present to determine: this may, perhaps, be the subject of a future communication.—*Fredk. W. Grant*; *Grove Villa, Putney, June 7, 1854.*

Notes on a Marine Aquarium. By GEORGE GUYON, Esq.

I SEND a few notes on a marine aquarium which I established at the commencement of the winter, as the subject seems to be exciting a good deal of interest at the present time. The experiment was conducted on a small scale, the "tank" being a confectioner's show-glass of about $1\frac{1}{2}$ pint capacity, and two-thirds filled with sea-water. The first few weeks were a succession of failures, the animals dying and the water becoming offensive. This was, I believe, in a great measure owing to the glass lid being kept on, under the impression that an atmosphere of oxygen would thereby be maintained in contact with the water; for on substituting for the glass cover a piece of perforated zinc (to allow of the transmission of air but prevent the escape of the occupants), the condition of the aquarium greatly improved. For the last three or four months the water has never been changed nor the weed renewed, and several of the animals have continued in a flourishing state throughout the period.

The delicate bright green sea-weeds of the *Ulva* tribe seem to be the most suitable; those in the jar now appear as fresh as when introduced. The red kinds that I have tried, though making a beautiful appearance while fresh, soon become sickly and lose their colour. The plants now in use were placed in the vessel just as they were torn from the rock, without any portion of their solid support being removed with them. Into this receptacle were introduced small fish, Crustacea, Mollusca, and Zoophytes. The fish were three specimens of the smooth shan, tried at different times, but not one survived twenty-four hours, which rather surprised me, as on one occasion I succeeded in keeping a specimen alive for more than half a year in a tumbler, as recorded in a former number of the 'Zoologist.' Among the Crustacea were some sand-shrimps, but they too appeared out of their element, and always died in a few days, or fell a prey to their stronger comrades, the crabs, on whom confinement seems to have no other effect than to increase their naturally crabbed disposition, and foster a spirit of exclusiveness, which resents the intrusion of almost any living thing as an infringement of their rights and privileges. One specimen of the common kind has ruled in the vivarium with iron sway for the last three months, and woe to any of the weaker brethren that do not get speedily out of his way. I once introduced a full-grown specimen of the porcelain crab (*Porcellana platycheles*), thinking that the large forceps and remarkable pinching powers of this species would compensate for its inferior weight to this doughty champion, but the next morning found my old friend quietly discussing a claw of his luckless victim, whose severed limbs ornamented the bottom of the jar. On the 27th of February I found a marine worm, with numerous legs (I believe a *Nereis*), among the rocks, and placed it in the vessel; two days after I discovered several fragments of it in the jar, consisting of four or five segments each, which had been cut asunder by the trenchant nippers of the aforementioned crab. On fishing out one of these portions, I was surprised to see it exhibiting strong motion, protruding and retracting the legs with considerable vigour. I placed it under the microscope, the better to observe the movement, at 10 minutes after 1 o'clock, and at 25 minutes after 2, when I went out, the motion still continued, but it had ceased on my return, at $\frac{1}{2}$ past 4. How long the segments had been severed, when first observed, it is impossible to say, but the movement was vigorous during the hour and a quarter that it was under observation. Among the Mollusca specimens, various common univalves were at different times introduced, and would flourish for

awhile, but in the end were pretty sure to fall victims to his Crustaceous Majesty, against whose insinuating ways no operculum was proof; one prudent limpet, however, has contrived to baffle his attempts for two or three months, and still shares the vivarium with safety. Having learned wisdom, it may be by the fate of his companions, he never quits the glass wall of his abode, but glides slowly about with his shield to the enemy, or rests quietly, head downwards, displaying no sign of life but by the motion of the little cilia which fringe his shell. But one portion of the inhabitants of this "crystal palace" have not yet been mentioned, between whom and the crab a mutual compact of forbearance seems to have been entered into: these are the Actiniæ or sea-anemonies, four or five of which have dwelt peacefully in the midst of this scene of carnage, that is to say there has been peace maintained between them and the Crustacean warrior, but with the weaker inhabitants of the jar they too wage war. When dropping in some sand-shrimps, on one occasion, a large specimen, that fell near a smallish Actinia, was instantly seized and *engulphed* by this apparently feeble creature. The crab's size is evidently his protection, but *they* are plainly distasteful to him, and he interferes not with large or small, save it may be to wrest from one any article of food which it happens to be devouring. Some smaller zoophytes of the Flustra tribe are interesting, from their graceful forms and quick movements; and the plumose tufts of the little Spirorbis, so common on various sea-weeds, make a pretty appearance in the glass. A mark is made on the side of the jar, and whenever the surface of the water, from evaporation, falls below this point, *fresh water* is added to make up the deficiency, so that the *saltness* as well as the quantity of the contents remain the same.

I fancy the readers of the 'Zoologist' will not be sorry if I now come to a conclusion, having, I believe, said enough to show that a considerable amount of amusement may be derived from even a pint of sea-water.

GEORGE GUYON.

Ventnor, Isle of Wight,
June 6, 1864.

NOTICES OF NEW BOOKS.

' *The Zoology of the Voyage of H.M.S. Herald, under the command of Captain Henry Kellett, R.N., C.B., during the years 1845—51.*' Published under the authority of the Lords Commissioners of the Admiralty. *Fossil Mammals.* By Sir JOHN RICHARDSON, Knt., C.B., M.D., F.R.S. London: Reeve & Co. 1852. 100 pp. Royal 4to with 15 folio Plates, price 21s.; and 40 pp. Royal 4to with 8 folio Plates, price 10s. 6d.

We find no advertisement, preface, or explanatory introduction, to inform us of the plan or extent of this truly splendid work, neither do the portions before us bear on the wrapper or title-page any such useful subtitle as "Part" or "Number" or "Fasciculus 1 or 2," or any other indication whether they constitute a portion or the whole of the work intitled the Zoology of the Herald. This is the more remarkable in contrast with the lucid arrangement of the botanical account of the same voyage, in which we had a succinct programme of the whole before the first division was commenced. We may further remark, that we are disappointed in finding no account of the recent Fauna of the countries visited by the officers of the Herald: this is doubtless in reserve, and will in due time make its appearance. After stating these objections to the plan, or, speaking with greater precision, the want of plan of this handsome quarto, we are ready to bear our testimony to the sterling value of what is before us. Whatever Sir John Richardson undertakes, he accomplishes; whatever he does, he does well: no descriptions of fishes in our own or any language can vie with his in laborious and unmistakeable accuracy; and although this division of Vertebrates appears to have obtained his more especial attention, yet he is perfectly at home in many other branches of Natural History, and in none more so than in the osteology of Mammalia, whether recent or extinct. We quote entire the introductory observations on the Fossil-Bone Deposit in Eschscholtz Bay, believing that this valuable document will be acceptable to our readers, and knowing that an author is always pleased to find his own views portrayed in his own words.

"The science of Chemistry, as at present taught, justifies our belief that animal substances, when solidly frozen and kept steadily in a temperature below the freezing point, do not undergo putrefaction, and may be preserved without change for any conceivable length of time. The depth to which, in northern countries, the summer thaw

penetrates, varies with the nature of the soil, but, except in purely sandy and very porous beds, it nowhere exceeds two feet in American or Siberian lands lying within the Arctic Circle. The influence of the sun's rays is not perceptible at this depth until towards the close of summer, which occurs at a varying period of from five to ten weeks from the time that the surface of the earth is denuded of snow by the spring thaw. During the rest of the year, even in the forest lands, though not so long there as in the open barren grounds, or *tundras*, the soil is firmly and continuously bound up in frost. The thickness of the permanently frozen substratum is more or less influenced by its mineral structure, but is primarily dependent on the mean annual temperature of the air acting antagonistically to the interior heat of the earth. Unless the mean heat of the year in any given locality falls short of the freezing-point, there exists no perennial frozen substratum at that place. It is not necessary that we should here endeavour to trace the isothermal line of 32° Fahr., as the reader may obtain a correct idea of its general course by consulting Baer's charts. It will suffice to say, that on the continent of America it passes some degrees to the southward of the 60th parallel of North latitude, and that while it undulates with the varying elevation of the interior, it has a general rise northwards in its course westerly.

"Where the permanently frozen subsoil exists it is a perfect ice-cellar, and preserves from destruction the bodies of animals completely inclosed in it. By its intervention, entire carcasses of the extinct mammoth and tichorhine rhinoceros have been handed down in Arctic Siberia from the drift period to our times, and being exposed by landslips, have revealed most interesting glimpses of the fauna of that remote epoch. Conjecture fails in assigning a chronological date to the time when the drift and boulders were spread extensively over the northern hemisphere: the calculations that have been made of the ages occupied in the formation of subsequent alluvial deposits are founded on imperfect data; and we merely judge from the absence of works of art and of human bones, that the drift era must have been antecedent to the appearance of man upon earth, or at least to his multiplication within the geographical limits of the drift. Whatever may be our speculations concerning the mode in which the carcasses in question were inclosed in frozen gravel or mud, their preservation to present times in a fresh condition indicates that the climate was a rigorous one at the epoch of their entombment, and has continued so ever since. Moreover, as large carcasses could not, without decomposition, be conveyed from a distance by water, it is fair to conclude that the animals lived in the districts in which they are found, or in their

immediate neighbourhood, and not, as some have supposed, in warmer and more distant regions.

"It seems also to us to be impossible that ice could have been the vehicle by which whole bodies or complete skeletons could have been brought from warmer parallels and deposited in the vast cemeteries of polar Siberia or in Eschscholtz Bay, for the simple reason that ice is not the product of these warm countries. Nor does the difficulty seem less of explaining how such a group of pachyderms and ruminants could have been brought down by travelling glaciers from warmer southern valleys of mountain ranges no longer in existence, without admitting such extensive changes in the surface-level of the district as would confound all our ideas of the distribution of the drift, as we at present find it.

"It is easier to imagine that the animals whose osseous remains now engage our attention, ranged while living to the shores of an icy sea, and that by some sudden deluge, or vast wave or succession of waves, they were swept from their pasture-grounds. It is not necessary that we should here discuss the extent of this deluge, or inquire whether it covered simultaneously the North of Europe, Asia, and America; or operated by a succession of great waves or more local inundations. What more immediately concerns our subject is to know that in the drift containing marine shells of existing species, and boulders borne far away from their parent cliffs, we have evidence of diluvial action extending from the *ultima Thule* of the American polar sea to far southwards in the valley of the Mississippi.

"The identification of the fossil mammoth and rhinoceros of England and Europe with those of Siberia by the first of living comparative anatomists, might lead us to conclude that the same fauna inhabited the northern parts of the New and Old World; but I think that we shall find evidence in the bones of bovine animals brought from Eschscholtz Bay, that an American type of ruminants was perceptible even in that early age.

"At the present time the moose deer and mountain sheep inhabit districts of America suited to their habits up to the most northern limits of the continent; while the musk ox and reindeer go beyond its shores to distant islands; and the Arctic hare is a perennial resident of the most northern of these islands that have been visited, or up to the 76th parallel. Supposing the climate of North America, at a time just antecedent to the drift period, to have been similar or nearly so to that which now exists, the habits and ranges of the former animals at the two dates, though the species differ, may have had a close analogy. The mammoth and other beasts that browsed on the twigs of

willows or large trees may have ranged as far North, at least in the summer, as the moose deer does now, or up to the 70th parallel; and lichenivorous or herbivorous ruminants may have extended their spring migrations still further North; — these journeys in quest of seclusion and more agreeable food being quite compatible with the co-existence of vast wandering herds of the same species in more southern lands, reaching even beyond the limits over which the drift has been traced, and where the final extinction of the entire races may be owing to causes operating in comparatively recent periods.

“The St. Petersburg ‘Transactions,’ and other works, contain accounts of the circumstances attending the discovery of the entire carcasses of a rhinoceros and of two mammoths in Arctic Siberia; and one cannot avoid regretting that they were beyond the reach of competent naturalists, who might, by examining the contents of the stomach, the feet, external coverings, and other important parts, have revealed to us much of the habits of these ancient animals, and of the nature of the country in which they lived. The inexhaustible deposits of organic remains in the Kotelnoi, or New Siberian Archipelago lying off the Sviatoi Noss, may yet disclose some equally perfect carcasses; and their exploration by a scientific expedition is a project that promises a rich return for the labour and expense of such an undertaking.

“In Arctic America, such remains have been discovered in its north-eastern corner alone; and, as yet, bones, horns and hair have only been obtained, without any fresh muscular fibre: but all the collectors describe the soil from which they were dug, as exhaling a strong and disagreeable odour of decomposing animal matter, resembling that of a well-filled cemetery. In August, 1816, Kotzebue, Chamisso, and Eschscholtz discovered, in the bay which now bears the name of the last-mentioned naturalist, some remarkable cliffs, situated a short way southwards of the Arctic Circle, and abounding in the bones of mammoths, horses, oxen and deers. The cliffs were described by their discoverers as pure icebergs one hundred feet high, and covered with soil, on which the ordinary arctic vegetation flourished. These novel circumstances excited strongly the attention of the scientific world; and when Captain Beechey and his accomplished surgeon, Collie, ten years later, visited the same place, their best efforts were made to ascertain the true nature of the phenomenon. Dr. Buckland drew up an account of the fossil remains then procured, with illustrative plates, and Captain Beechey published a plan of the locality.

"This plan comprises a nearly square section of country, having a width and length of about fourteen miles. The Buckland River, where it bends to the northward to fall into Eschscholtz Bay, flanks the district on its inland or eastern border. From the mouth of this river the coast-line trends nearly due West to Eschscholtz Bluff, and forms the south side of that bay; the shore for one-half of the way, or about seven miles, between the bluff and Elephant Point, being composed of high icy cliffs, and for the remainder of the distance, or from Elephant Point to the river, the coast is low and slightly incurved. The west face of the land fronts Kotzebue Sound, and is formed of slaty gneiss rocks, which terminate on the North at Eschscholtz Bluff, and ten or twelve miles to the southward the rocky eminences, taking an inland direction, are flanked by low marshy ground. A ridge of hills runs parallel to the western shore at a distance of a mile and a quarter, and at their southern angle, where they bend inland, there stands still nearer the coast-line one of the loftiest bluffs, ascertained to be 640 feet high. From this corner the course of the range is south-easterly, the swampy country above mentioned running along its base. The banks of the Buckland are also represented as being high, if not hilly, and they inclose, in conjunction with the range, a sloping valley or basin, drained by numerous rivulets, and opening to the North on the low coast eastward of Elephant Point. At the western entrance of the Buckland there is a minor display of frozen mud-cliffs; similar deposits exist also on its eastern bank, as well as on the north shore of Eschscholtz Bay, likewise on various points of the coast between Beering's Strait and Point Barrow; but fossils have been detected only in Eschscholtz Bay, and on the banks of a few rivers that join Beering's Sea between it and Mount St. Elias.

"The following extracts from the Narrative of Captain Beechey's voyage contain a description of the cliffs by a skilful observer:—

"We sailed up the (Eschscholtz) bay (28th July, 1826), which was extremely shallow, and landed at a deserted village on a low sandy point, where Kotzebue bivouacked when he visited the place, and to which I gave the name of Elephant Point, from the bones of that animal being found near it. The cliffs are from twenty to thirty feet in height, and rise inland to a rounded range of hills between four and five hundred feet high above the sea. In some places they present a perpendicular front to the northward, in others a slightly inclined surface, and are occasionally intersected by valleys and water-courses, generally overgrown with low bushes. Opposite each of these valleys there is a projecting flat piece of ground, consisting of the materials

which have been washed down the ravine, where only good landing for boats is afforded. The soil of the cliffs is a bluish-coloured mud, for the most part covered with moss and long grass, full of deep furrows, generally filled with water or frozen snow. Mud in a frozen state forms the surface of the cliff in some parts; in others, the rock appears with the mud above it, or sometimes with a bank half way up it, as if the superstratum had slid down and accumulated against the cliff. By large rents near the edges of the mud-cliffs they appear to be breaking away, and contributing daily to diminish the depth of water in the bay.—P. 257.

“ ‘ Such is the general conformation of this line of coast. That particular formation, which, when it was first discovered by Captain Kotzebue, excited so much curiosity, and bore so near a resemblance to an iceberg as to deceive himself and his officers, remains to be described. As we rowed along the shore, the shining surface of small portions of the cliffs attracted our attention and directed us where to search for this curious phenomenon, which we should otherwise have had difficulty in finding, notwithstanding its locality had been particularly described; for so large a portion of the ice-cliff has thawed since it was visited by Captain Kotzebue and his naturalists, that only a few insignificant patches of the frozen surface now remain. The largest of these, situated about a mile to the westward of Elephant Point, was particularly examined by Mr. Collie, who, in cutting through the ice in a horizontal direction, found that it formed only a casing of the cliff, which was composed of mud and gravel in a frozen state. On removing the earth above, it was also evident, by a decided line of separation between the ice and the cliff, that the Russians had been deceived by appearances. By cutting into the surface of the cliff, three feet from the edge, frozen earth, similar to that which formed the face of the cliff, was found at eleven inches’ depth, and four yards further back the same substance occurred at twenty inches’ depth. This glacial facing we afterwards noticed in several parts of the Sound, and it appears to be occasioned either by the snow being banked up against the cliff or collected in its hollows in the winter, and converted into ice in the summer by partial thawings and freezings, or by the constant flow of water during the summer over the edges of the cliffs, on which the sun’s rays operate less forcibly than on other parts in consequence of their aspect. The streams thus become converted into ice, either in trickling down the still, frozen surface of the cliffs, or after they reach the earth at their base, in which case the ice rises like a stalagmite, and in time reaches the surface.

But before this is accomplished, the upper soil, loosened by the thaw, is itself projected over the cliff, and falls in a heap below, whenever it is ultimately carried away by the tide.

“(September, 1826). The cliffs in which the fossils (collected by Mr. Collie) appear to have been imbedded, are part of the range in which the ice formation was seen in July. During our absence of five weeks, we found that the edge of the cliff in one place had broken away four feet, and, in another, two feet and a half, and a further portion of it was on the eve of being precipitated on the beach. In some places where the icy shields had adhered, nothing now remained but frozen earth from the front of the cliff. By cutting those parts of the ice which were still attached, the mud in a frozen state presented itself as before, and confirmed our previous opinion of the nature of the cliff.”—P. 323.

“The above description of these remarkable cliffs has been quoted at length, as it is not only perfectly clear but concise. The opinions of Captain Beechey and his officers respecting the origin of the ice-cliffs are discussed at considerable length in Dr. Buckland’s paper, printed as an Appendix to the Narrative of the Voyage. Mr. Collie describes the fossiliferous cliff as facing the North, and extending two miles and a half in a right line, with few interruptions, and as having a general height of about ninety feet. It is composed of clay, he says, and very fine quartz and micaceous sand, assuming a grayish colour when dry. The land rises gradually behind the cliff to an additional height of one hundred feet, and is clothed with a black boggy soil, that nourishes brown and gray lichens, mosses, several *Ericaceæ*, *Gramineæ*, and various herbaceous plants, and is intersected by valleys pervaded by streams, and having their more protected declivities adorned with shrubs of willow and dwarf birches. ‘The specimens taken out of the débris at the foot of the cliff (none were dug out of the cliff itself) were in a better state of preservation than those which had been alternately covered and left exposed by the flux and reflux of the tide, or imbedded in the mud and clay of the shoal. A very strong odour, like that of heated bones, was exhaled wherever the fossils abounded.’—P. 509.

“After an interval of twenty-four years, the recent voyage of the ‘Herald’ to this interesting spot has given a third opportunity of collecting fossil bones, and examining the structure of these now far-famed cliffs. Captain Kellett, Berthold Seemann, Esq., and Dr. Goodridge, with the works of Kotzebue and Beechey in their hands, and an earnest desire to ascertain which of the conflicting opinions

announced by these officers, was most consistent with the facts, came to the conclusion, after a rigid investigation of the cliffs, that Kotzebue was correct in considering them to be icebergs. I have been favoured with papers on the subject from each of the Herald's officers named above, and shall quote as fully from them as my limits allow, after premising a few general observations on the frozen cliffs of other parts of the Arctic coast that have come under my personal observation.

"At Cape Maitland, in Liverpool Bay, which forms the estuary of the Baghula River, and lies near the 70th parallel, there are precipitous cliffs from eighty to one hundred feet high, composed of layers of black clay or loam, inclosing many small water-worn pebbles and a few large boulders. With the exception of about eighteen inches of soil on the summit, which thaws as the summer advances, these cliffs present to the sea a constantly frozen wall, that crumbles annually under the action of the rays of a summer sun, but the fragments being carried away by the waves, and prevented from accumulating, the perpendicular form of the cliff is preserved. Elsewhere on the coast, cliffs equally vertical, but having a different exposure, were seen masked by a *talus* of snow, over which a coating of soil had been thrown by land-floods of melting snow pouring down from the inland slopes. The duration of these glacier-like snow-banks varies with circumstances. When the cliffs rise out of deep water, the ice on which the *talus* rests is broken up almost every summer, and the superincumbent mass, previously consolidated by the percolation and freezing of water, floats away in form of an iceberg. In other situations the snow-cliffs remain for a series of years, with occasional augmentations marked by corresponding dirt-bands, and disappear only towards the close of a cycle of warm summers. In valleys having a northern exposure, and sheltered by high hills from the sun's rays, the age of the snow may be very considerable; but it is proper to say that though aged glaciers of this description do exist on the shores of Spitzbergen and Greenland, they are of very rare occurrence indeed on the continental coast of America. The ice-cliffs of Eschscholtz Bay may have had an origin similar to that of the Greenland icebergs, and have been coated with soil by a single or by successive operations. I find it difficult, however, to account for the introduction of the fossil remains in such quantity, and can offer to the reader no conjecture on that point that is satisfactory even to myself. The excellent state of preservation of many of the bones, the recent decay of animal matter shown by existing odour, quantities of hair found in contact with a mammoth's skull, the occurrence of the outer sheaths of bison

horns, and the finding of vertebræ of bovine animals lying in their proper order of sequence, render it probable that entire carcasses were there deposited, and that congelation followed close upon their entombment. A gradual improvement of climate in modern times would appear to be necessary to account for the decay of the cliffs now in progress, and the exposure of the bones. The shallowness of the water in Eschscholtz Bay, its narrowness, and its shelter from seaward pressure by Choris Peninsula and Chamisso Island, preclude the notion of icebergs coming with their cargoes from a distance having been found upon the beach at that place. Neither is it more likely that the bones and diluvial matters were deposited in the estuary of Buckland's river, and subsequently elevated by one of the earth-waves by which geologists solve many of their difficulties, for ice could not subsist long as a flooring to warmer water. In short, further observations are still needed to form the foundations of a plausible theory.

"Dr. Goodridge describes the several cliffs in succession with much detail, beginning with that next Elephant Point and proceeding to the westward. His paper, though interesting throughout, is too long for transcription entire, and I shall therefore merely abstract the most material parts. He commences by stating that the unusually mild season had produced great landslips, and exposed the structure of the several eminences forming the cliffs more extensively than in the year in which Captain Beechey visited them. Elephant Point, forming a high promontory in 1826, had now subsided to a mere hillock by the thawing of the icy substratum, as Kotzebue predicted would happen. A pit was dug to some depth in the loose loamy soil of this hillock, formed of the débris of the ruined cliff, at a point where the thigh-bone of a mammoth protruded above the surface, without any ice being found; but on the east of the hill next in succession, a wedge-shaped landslip had left a triangular chasm, whose floor, elevated twenty feet above the beach, was bounded by walls fifty feet high, of fine transparent ice; and its interior angle, reaching thirty feet backwards from the face of the cliff, exhibited an alluvium seemingly undisturbed since it was originally deposited, and consisting of regular layers of drift and peat, covered with thick beds of broken sticks and vegetable matter, over which lay a stratum of red river-gravel, then a bed of argillaceous earth, capped by dry friable mould and surface peat, nourishing its peculiar vegetation of coarse grass, moss, lichens, &c. The icy side-walls showed bands or layers considerably inclined, and testifying to their origin in drift snow; and the size of the sticks

imbedded in the back walls of the chasm was greater than that of the stems of any of the bushes now growing in the neighbouring ravines. It is to be recollected, however, that a short way up Buckland River groves of spruce-fir are to be met with. A rivulet separates this hill from Elephant Point, and Dr. Goodridge found some of its slopes to be formed of semi-fluid mud, over which a man could not pass. On the *second* hill or cliff the depth of soil varied with the unevenness of the ice on which it rested, from twenty feet to less than four, the soil being everywhere dry. On dipping in one spot to the latter depth the surface of the ice was found to incline upwards in the direction of the hill, and the soil thrown out by the spade was so pulverulent that it was readily blown away by the wind. The *third* hill, which projected more boldly than the others, contained, as far as it was explored, neither fossils nor ice, but seemed to be entirely composed of thick beds of peat, *logs* of wood, sticks, and vegetable matter, lying generally, but not regularly, in a horizontal position, resting on dry clay, and a bed of river-gravel two feet thick. The *fourth* hill presented a higher and more extensive ice-cliff than any of the others, the ice having melted further back towards the centre of the hill, and forming an even wall upwards of eighty feet in height. The *fifth* cliff or marked projection, in proceeding to the eastward, appeared to have sunk bodily from the hill forming its back-ground, but had left behind it a few icy pillars and detached walls standing twenty feet above the surrounding level surface, and still covered with from seven to ten feet of soil. Water was flowing copiously from these walls of ice, and they were transparent, without admixture of earth, while the soil which capped them was dry and friable. In the slope of this ruined cliff most of the fossils obtained on this occasion were found, a few small fragments only having been gathered from the soft mud at its foot. Some were collected from the surface of the slope, others were dug out at places where the tips of the tusks protruded through the soil.

"A deep valley, through which a stream of water flows, divides the *sixth* hill from the preceding one. Portions of this hill had subsided from the melting of the icy foundation; but in one part a solitary block of ice, about twenty feet square, rose above the surface, retaining a thin layer of soil on its summit. From the vicinity of this block the hill rose abruptly on all sides; its declivity descended without break to the beach, and its soil, except in the section that had sunk, did not appear to have been ever disturbed. The beach at this place was not composed of muddy detritus, like that which skirted the

bases of the other cliffs. A mammoth tusk, having been noticed protruding above the surface of this hill, was traced downwards by digging to the depth of eight feet; and the skull with a quantity of hair and wool were found lying on a thin bed of gravel, beneath which was solid transparent ice. Enveloping the bones there was a bed of still clay, several feet in thickness, and mixed with them a small quantity of sticks and vegetable matter. The superficial soil was loose and dry. A strong, pungent, unpleasant odour, like that of a newly opened grave in one of the crowded burial-places of London, was felt on digging out the bones, and the same kind of smell, in a less degree, was perceptible in various other places where the cliffs had fallen. From the same pit out of which the mammoth's skull was dug the bones of some smaller animals (a scapula, tibia, &c.) were taken, and were duly labelled at the time, but in the course of their transfer from one public department to another, after reaching London, the labels have been lost, together with the specimens of the buried wood, gravel, and other matters found associated with the bones. Dr. Goodridge says that this eminence was the last examined, the approach of night having prevented the party from exploring another hill lying between it and Eschscholtz Bluff: that hill, however, was covered with luxuriant vegetation, and no icy cliffs showed themselves.

“ ‘On Choris Peninsula,’ says the same gentleman, ‘frozen soil was found at the depth of four feet at the end of September, after an unusually warm summer; and a cask full of flour deposited by Captain Beechey in 1826, on Chamisso Island, was perfectly sound and fit for food when disinterred in 1848. It was disengaged with much difficulty from the frozen subsoil, and even the iron hoops of the cask were not rusted.’ Dr. Goodridge appends to his paper some remarks on the annual waste of the ice-cliffs, and says that the bay is gradually filling up with the clay and soil which are precipitated into the sea on the melting of the ice on which they had reposed.”

‘*The Annals and Magazine of Natural History.*’ No. 78, dated June, 1854; price 2s. 6d. London: Taylor & Francis, Red Lion Court, Fleet Street.

The contents of this number are as follows:—

‘On some new Genera and Species of Fossil Fishes.’ By Sir Philip Egerton, Bart., F.R.S., &c.

'Monograph of the British Graphideæ.' By the Rev. W. A. Leighton, B.A., F.B.S.E.

'Notes on the Ornithology of Ceylon, collected during an Eight Years' Residence in the Island.' By Edgar Leopold Layard, F.Z.S., C.M.E.S., &c.

'Description of a new *Helix* from Montpellier and a new *Hydrobia* from Nice, with Observations on some Varieties of the Extra Marine Shells of those Districts.' By John Paget, Esq.

'Notices of British Fungi.' By the Rev. M. J. Berkeley and C. E. Broome, Esq.

'A Reply to Prof. Sedgwick's Article published in the Annals and Magazine of Natural History for April, 1854.' By Prof. Milne-Edwards.

'A Synopsis of the Fissirostral Family *Bucconidæ*.' By Philip Lutley Sclater, M.A., F.Z.S.

'On the Anatomy of the Giraffe.' By T. Spencer Cobbold, M.D., Conservator of the Anatomical Museum, University of Edinburgh.'

'On the Growth of Sea-Weeds.' By P. H. Gosse, Esq., A.L.S.

Proceedings of Learned Societies:—Zoological—Royal Botanical of Edinburgh.

Miscellaneous:—Note on *Bellia arenaria*; by C. Spence Bate. Mr. Bowerbank and Prof. Sedgwick; by Prof. M'Coy. On the Habits of the Mungoos; by Lieut. Pegus. New locality for *Viola lactea*; by C. C. Lucas. On some Varieties of Land Shells from the South of France; by J. Paget. Schærer's Collection of Lichens.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

June 5, 1854.—W. WILSON SAUNDERS, Esq., Vice-President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—The '*Zoologist*' for June; by the Editor. The '*Athenæum*' for May; by the Editor. The '*Literary Gazette*' for May; by the Editor. The '*Journal of the Society of Arts*' for May; by the Society. '*Entomologische Zeitung*,' January to April; by the Entomological Society of Stettin. '*Revue et Magasin de Zoologie*,' 1854, No. 4; by the Editor, M. Guérin-Méneville. '*Proceedings of the Royal Society*, Vol. vi. No. 102, Vol. vii. No. 3; by the Society. '*Zeitung für Zoologie*,

Zootomie und Palæozoologie, herausgegeben von Dr. E. D'Alton and Dr. H. Burmeister; 1848, 2 Quartal. 'Bemerkungen über den allgemeinen Bau und die Geschlechtsunterschied bei den Arten der Gattung Scolia, Fabr.' von Dr. H. Burmeister; both presented by Dr. Burmeister. 'Proceedings of the Berwickshire Naturalists' Club' for 1853; by the Club. A box of British Micro-Lepidoptera; by Mr. Douglas. Two boxes of insects collected in Burmah, and presented by Captain Hamilton, M.E.S.: this collection contains several very rare and new insects, including a new Goliath beetle, which Mr. Westwood described under the name of *Narycius Hamiltonii*, and seven specimens of a wasp which M. de Saussure has just described from the single example hitherto seen in Europe, now in the British Museum: the Society passed a special vote of thanks for this valuable donation.

The Society's Excursion.

The Chairman announced, that in consequence of the opening of the Crystal Palace having been fixed for the 10th instant, the excursion of this Society, which was appointed for that day, would not take place; but the Council recommended an excursion to Darenth Wood on the 17th inst. instead.

Exhibitions.

The Secretary exhibited some very beautiful drawings, by Mrs. Hamilton, of the transformations of Indian insects, which that lady had forwarded for the use of the Society.

Mr. Smith exhibited several Hymenoptera, taken by Mr. Foxcroft, in Scotland, including *Osmia parietina*, of which he found a nest under a stone; a new species of *Andrena*; and two specimens of an *Andrena* which agree in every respect with some in the British Museum received from Nova Scotia, which he had placed doubtfully as dark varieties of *A. Clerckella*.

Mr. Janson exhibited some Coleoptera, sent from Scotland by Mr. Foxcroft, mentioning especially *Elater (Diacanthus) impressus*, *E. lythropterus*, Germar., *Pogonocherus fasciculatus*, *Sericosomus brunneus*, *S. fugax* and *Dictyopterus Aurora*. He likewise exhibited a larva of *Aplecta tincta* with two excrescences, resembling *Clavariæ*, proceeding from the head, and which the captor states were green when the larva was alive.

Mr. Stevens exhibited a moth (*Leucania*?) found covered with a fungoid film; a fly, found impaled on a point of dry grass; two living larvæ of *Notodonta Carmelita*, part of the brood hatched from the eggs laid by the female exhibited at the last Meeting; and a specimen of the scarce *Incurvaria tenuicornis*, taken flying at Wickham Wood, in May.

Mr. Douglas exhibited *Drilus flavescens*, taken on flowers near Darenth Wood, June 1st; and seven species of *Elachistæ* reared from the larvæ, including the new one from *Poa aquatica*, for which he had proposed the name of *E. Poæ*.

Mr. Westwood exhibited some cocoons of the "*Eria*" silk forwarded from Malta by Dr. Templeton, with a request that he might be informed if any method was known by which the silk could be unwound from these cocoons, in which the silk was agglutinated into a solid mass, and hoping, if such a method was not known, some attention would be given to the subject, as, if this difficulty were overcome, there was no doubt this silk would become extensively used.

The Chairman said that very recently a gentleman, residing near Geneva, had asked his aid to procure some Indian silk 'cocoon', such as were exhibited by the East India Company at the Great Exhibition of 1851, in order to carry on some experiments of unwinding hard cocoons, in which he had hitherto been successful; and now that, by the extension of the cultivation of this valuable silk by its introduction into Malta (Zool. 4276), the supply would be increased, it was highly desirable that the difficulties of drawing off the threads should be conquered, and he trusted his correspondent would be successful with this kind also.

Mr. Boyd exhibited specimens of *Elachista Treitschkiella*, reared from the curious larvæ destitute of true legs, some of which were exhibited by Mr. Douglas at the Meeting of this Society in September last (Zool. 4066).

Goliath Beetles.

Mr. Westwood read a Memoir on Goliath beetles, describing several new species, and others of which one sex only was hitherto known.—*J. W. D.*

SOCIETY OF BRITISH ENTOMOLOGISTS.

June 5, 1854.—Mr. HARDING, President, in the chair.

The President exhibited a pair of *Cloantha conspicillaris*, taken at Darenth Wood. The female laid some eggs, which had hatched, and the young larvæ were now feeding. He also exhibited some specimens of *Trochilium culiciforme*, *Pompelia Perfluella*, and other Lepidoptera.

The President related a remarkable circumstance connected with *Abrostola Urticæ*: last July he took a number of the larvæ of this insect; about the 20th of last month the perfect insects began to make their appearance, and from that time until the 3rd of the present month, being a succession of fourteen days, they have come out one each day: in no instance had there been a day missed, nor did two appear on the same day.

The President also exhibited some specimens of the new *Elachista* which he had discovered last year, about this time, feeding on *Poa aquatica*, and which he saw Mr. Douglas proposed to call *Elachista Poæ*. He, however, proposed to call it *Elachista aquaticella*, a name he considered much more in accordance with its habits.

Mr. Miller exhibited a specimen of *Leptura sexguttata* taken at Darenth Wood; also specimens of *Ephyra trilinearia*, *Lithosia flava*, *Eupithecia abbreviata* taken at Loughton, *Pyrochroa coccinea*, &c.

DUBLIN NATURAL HISTORY SOCIETY.

June 16, 1854.—JAMES R. DOMBRAIN, Esq., in the chair.

The following paper, by Mr. Andrews, was read:—

Habits of the Salmon.

"It had been my intention this evening to have submitted to the Society some peculiarities that I had observed in the spawning states of the Syngnathidæ, or pipe-fish family, more especially with reference to *Syngnathus typhle*—the deep-nosed pipe-fish, and to the straight-nosed pipe-fish (*S. ophidion*), and to have added a review of the several British species (all of which I have obtained on the South-west coast), detailing their several habits and seasons of spawning. From this, however, I have been diverted by several communications that have been made relative to the habits of the salmon, and as to the identity of the fish known as the parr or gravelling with the *Salmo salar*. This being a subject of such importance, not only in a scientific point, but in its practical application, that I again lay aside my paper upon the Syngnathidæ, with the hope that this will afford full discussion of interest for the evening. It may be in the recollection of the Members a paper of great interest given by Mr. Ffennell, Inspecting Commissioner of Fisheries, in the month of February, 1849, "On the Habits and Spawning States of the Salmon, and upon the Salmon Fisheries of this Country." In that paper Mr. Ffennell supported the views of Mr. Shaw, of Drumlanrig, relative to the first, and the parr state of the young salmon, and its remaining two years in the river before it assumed the smolt or migratory state; and though he admitted that the seasons and the condition of salmon were not the same in all rivers, yet he maintained that a uniform system of open and close season should be adopted in order to prevent the nefarious and injurious system that might probably result in salmon being exposed for sale in a public market taken from a close river while other rivers were open. This paper was in some measure an explanation with reference to an inquiry held on the fisheries of the Caragh and the Laune, in Kerry. My friend Mr. Williams, at that meeting of the Society, energetically disputed that the fish known generally as the parr or gravelling was the young of the salmon. He had made examinations of an extensive collection of that little fish, which he had obtained throughout the seasons from the rivers of Cork and of Wicklow, and he was not disposed to agree with Mr. Shaw, of Drumlanrig, that all gravelings were the young of the salmon. At the meetings of the months of April and of May last notices were again brought forward by Mr. Ffennell and by Mr. Williams, and which, differing in some views and principles, I thought it might lead to interesting, and I trust useful discussion, to submit some of the fish in the parr and in the smolt state, and to offer a few remarks. At the time of that discussion, in 1849, my attention had been chiefly directed to the sea-fisheries of the West coast; but during the seasons of 1848, 1849 and 1850, I had ample practical means of forming observations in the salmon fishery connected with the project I was engaged in. Determined to follow out that inquiry as time and circumstances permitted; my friend Mr. Williams accompanied me on the 23rd of May to Carlow, to visit the little river Owd. Former recollections and frequent fishing excursions satisfied me that the little fish known and described as the parr by Yarrell existed there in abundance. The rivers Greece and Ler, which stream through the borders of Carlow and Kildare, and empty

into the river Barrow, are famous for their excellent trout; the former, a lively stream, rapid over clean gravelly beds, produces abundance of bright and well-fed trout. Although the day was in every way unsuited to the wishes of a fly-fisher, we, however, soon obtained the object of our search. Many years have passed since my former visits, but there was the same purpling restless stream, the banks, the untopped wall leading to the old bridge, unchanged and untouched as it were but yesterday. Carlow is delightfully rural; its avenue-like roads, bordered with tall fragrant hawthorn, made us buoyantly feel the change from city life. Besides, to the naturalist, every step afforded interest—along the banks of the river the *Ephemera* and the *Phryganea*, as they suddenly emerged from the pupa state, almost as suddenly merged into the stomach of some lively trout—the light and the dark ash-fox, brown and gray Coughlins, and the hawthorn flies, as they floated along, or fluttered about the stream, were all the objects of attraction. The question which we sought the elucidation of, was not as to whether salmon do or do not enter the Greece from the Barrow, or whether the shallow beds of that little stream are, or are not, suited for spawning-ground, but with regard to the distinctive characters of the parr existing there, its comparison with that described in Yarrell, and with that of the true salmon-fry. The local terms, lasprings, gravel-lasprings, salmon-pink, fingerlings, gravellings, parr, and samlet, have all been made of too general application, and no proper separation has been drawn to distinguish habits or characteristics, but to confound all as gravellings, and gravellings to be the parr, the young of the salmon. My friend Williams had argued that the gravelling that he had obtained in some of the rivers of Cork and of Wicklow, were not the young of the salmon, and so far he was right, for neither were those we obtained in the Greece. These latter were identical with the accurate descriptions given by Yarrell, by Dr. Heyshaw, and by several authors—the head being of a greenish ash-colour; back and sides above the lateral line dusky, or olivaceous brown, marked with numerous dark spots, bordering the lateral line a series of carmine or vermilion-coloured spots; belly silvery white, and the body marked with nine or ten bluish-coloured transverse bars; gill-covers have generally two dark-coloured spots, one more strongly marked than the other; dorsal fin with a few dusky spots; pectoral fins larger than those of the common trout, yellowish white, anal and ventral fins yellowish, caudal fin much forked; body deeper in proportion to its length; general length from four to six inches. Now, on comparing these specimens with those of the true salmon-fry, obtained from the Bandon, Laune, and the Caragh rivers, we find great distinction of development and markings. In the true salmon-fry, the head more blunt; broader on the neck and shoulders; gill-covers marked similar with spots silvery gray; preoperculum much rounded; external edge soft; back dusky ash-colour, with numerous minute dark spots, which do not go beneath the lateral line; nine bright orange, or approaching to vermilion-coloured spots along the lateral line, equalling in number the transverse bars; pectoral fins long in proportion, yellowish white, tinged with black dusky spots, generally absent in the dorsal fin; caudal fin largely developed; ventral and anal fins yellowish white; belly white. The body is narrower in proportion to its length than that of the parr, and the teeth in a more rudimentary state. I am not prepared to admit the parr being a distinct species, for it is the young state of the fish, and all the specimens of the *Salmonidae* that I have obtained are more or less in the young state characterised by those transverse bars. In the rivers where it frequents the parr is abundant in all seasons, in the same stages of growth; and even when the memorable floods of the winter of 1849 were supposed to cause the scarcity

of 1860, the parr was equally abundant. An experienced salmon-fisher, and employed in the salmon-fisheries of the Laune, states that the barred gravelings are to be found there all the year round of the same growth,—that he considers them to be distinct from the true salmon-fry, which is not to be found at the end of May or the month of June of any size, all the full-grown fry having gone to the sea, while those of the season are too small to be noticed. In order to illustrate that confusion might naturally exist with regard to the gravelling, Mr. Andrews exhibited specimens of a series of the following:—Salmon-fry, from the Caragh, Laune, and Bandon rivers; parr, from the Greece, the Bandon and the Caragh; young of the white trout, from the Laune and the Bandon rivers; young of the brown trout, from the Caragh; smolts, with migratory dress, from the Laune river. To all these terms the ‘gravelling’ were generally applied. A most intelligent friend of Mr. Williams observes, that on the Bandon river he has marked numbers of gravelling, and that afterwards he has taken them as peal. No doubt among them he may have marked the true salmon-fry, and on their return from the sea have taken them as peal, but no proof can be afforded that all marked underwent the same change. A characteristic mark in the young state of the salmon-fry and the brown trout is the yellowish gray colour of the adipose fin of the former, while in the latter it is tinged and tipped with bright orange. From these specimens exhibited, and from some of the foregoing remarks, a question would arise as to the several states of growth and age of the fry and smolts. To Mr. Shaw, of Drumlanrig, undoubtedly belongs the merit of determining the true state of the fry from the ova; but still his observations have not all been satisfactorily conclusive. The trials and experiments of development carried on artificially in ponds and in tanks may, to a certain extent, illustrate extrication from the ova and changes of the fry state; but to the habits of an animal peculiarly sensitive through those changes of growth, that growth must be more or less retarded by the deprivation of its natural acts and resources. Mr. Shaw successfully proved the experiment with regard to the character of the fry by taking them direct from the spawning-beds of the salmon; and to him much is due for so perseveringly pursuing such well-directed inquiries, and to the shame of preceding naturalists, who ought to have sifted what really was the young state and habits of a fish of such importance in the economy of our industrial resources. His experiments only so far prove what really are the young of the salmon, not that all young states of the Salmonidæ, named parr or gravelling, are the young of the salmon. In his treatise, ‘Experimental Observations on the Growth of Salmon Fry,’ Mr. Shaw mentions, at page 4, ‘that after the so-called smolts have descended to the sea, none of the larger can be detected in the rivers.’ The idea that the male parr consorts with the female salmon is too delusive to be supported. What attainable object is advanced by such a departure from all natural laws? That the ova and the milt in a rudimentary state may be detected in the young stages of the true salmon-fry I do not deny; but that the female salmon, which is incapable of the fecundating development of the ova until after the third year of existence and first return and enlarged growth from the sea, can be impregnated by the male of the fry, which had not visited the sea nor undergone those changes necessary for mature growth, appears contrary to all physiological principles. It is true that parr, graveling and small trout, on the spawning-beds of the salmon, during the periods of spawning, may constantly be noticed, for such shoals of the river are their proper locality. O’Gorman, who wrote ‘The Practice of Angling in Ireland,’ a most experienced salmon-fisher, and who now enjoys a fine old age in the town of Ennis, could

never be persuaded of the parr state of the salmon, but that all the young retreated to the sea the first season of their existence. My own observations and inquiries would lead me to consider that from the period of the extrication of the fry from the ova to the change to its smolt or migratory state would be about 13 or 14 months. In some rivers the fry are in a more advanced state in the winter and spring months than in others, that is, undergoing earlier extrication from the ova, according to the temperature of localities or to early or late breeding fish. Hence the varied growth throughout the summer and autumn; and I further consider that the great bulk of these assume the migratory state in the following spring, descending early in April and May to the sea. That they assume the silvery scales and full migratory dress in the higher portions of the river, before their movement to the sea, I have frequently detected. Referring to my notes, I find that some years since, when fishing in the county of Clare, about the first week in May, in company with the late James o'Gorman, I met the salmon-fry in abundance, with the silvery scales or migratory coat, in that part of the Cooraclare river between the bridges of Ballydoneen and Goulbourne. Some dozens were taken in a part of the stream that ran rapidly over a rocky and gravelly bed which high banks overhung. It was close to a spawning-bed of the salmon. These fish had perfectly assumed the silvery scales of the smolt, tapering in form, and with pectoral and caudal fins largely developed, the terminal parts tinged with a dark shade. Subsequent observations and application to the subject influenced me to consider that they were the young of the ova of the previous year, and that they had only attained their 13th or 14th month, their migration to the sea being between the 11th and 14th month from the period of extrication from the ova. The river of Cooraclare, which assumes the name of Dunbeg, where it falls into the Atlantic Ocean, in the little estuary of that name, is famous for its salmon. In August, 1835, I saw in one haul 104 salmon and 200 white trout, taken by Michael Kennedy from the lake below the bridge and fall, under Dunbeg Castle. The rivers Creegh, Annageeragh, and Annagh, which I have fished, are all excellent in their seasons for salmon and white trout. In the little river of Monmore, which runs through the great bog of that name, salmon and white trout run up the stream in the autumn floods, but I never recollect meeting the gravelling there with the markings and bright hue of the parr. It is not my intention now to enter into a statement of the salmon-fisheries, but merely to refer to some of the observations made by Mr. Ffennell in this Society. At the meeting in April, Mr. Ffennell mentioned that at the approach of the spawning-season the male salmon invariably first ascend the rivers from the sea. It is singular that authors have given the precedence to the females, both to the salmon and to the trout. Allowing either the priority, experience has shown that the parent fish are on the spawning-beds together, each occasionally engaged, but more especially the female, in the excavation of the furrow or channel where the ova are to be deposited, and in this labour their principal exertions are snouting the gravel. The clear and shoaler beds of a river, where it is necessary for the salmon to select the deposit-beds for the due maturing of the ova, can be quietly watched and all their operations noticed. In the Wandle Mr. Gurney has seen the large trout raise ridges of gravel, and has remarked their noses or snouts to be lacerated by the work. The romantic history of Remy, the fisherman of the Vosges, pursuing his patient watchings on the habits of the trout, in the bleak nights of November, and which reflect lustre on his powers of observation, is pleasingly told. No such endurance is necessary to mark the operations of the parent salmon. Some have observed that the hook of the male salmon serves some purpose

in the spawning operations. This curvature of the under jaw is peculiar both to the male salmon and the trout, and which is more or less developed according to age or state of health of the fish. On the ascent from the sea the hook is merely observable, but after the exhaustion of spawning the reduced condition of the fish renders it more conspicuous; and should obstacles prevent the proper period of return to the sea, a cartilaginous extension takes place (whence it is called Carraughabaugh), but which disappears on the renewed health of the fish, in its visit to the sea. In aged fish, particularly in large trout, this curvature becomes permanent in its enlargement, forming a deep fossette in the upper jaw. Without a good foundation of scientific and practical knowledge combined in the pursuits of such subjects, it is a task of great difficulty to select with judgment the plausible opinions that are frequently advanced by writers of known character, but who at the time perhaps only possess general views of the matter of which they treat. Thus, Mr. Keiller, in 'Lloyd's Scandinavian Adventures,' states the habits of the salmon of the Save, in Norway, to be such as are altogether different from that of the British Isles; forming no channel for the deposit of the ova, but allowing them to float down the stream, impregnated by the milt, similarly floating, and, finally, whatever escapes the rapacity of the river fish settles in some crevice or rock until the fry is excluded. This is so contrary to the natural principles of the family of the true salmons as scarcely to be worthy of dependence; for, more probably, the floating ova that escaped the maws of hungry trout would settle in some quiet pool beyond the medium of maturation, and finally perish. In fact, it is characteristic of the Clupeidæ or herring family, which, in the spawning-seasons, seek the inlets and shallows of our shores, where the excluded ova, in myriads, float away at the mercy of the tides; besides, a far greater distinction exists in the specific gravity of the ova of the salmon, the trout, and the herring—those of the former, the greater portion sink at once to the bed or furrow, where they are impregnated by the male, and remain without removal. In the Clupeidæ, expulsion of the ova in masses spread far, and float a considerable time, even where no force of tide or wave would drive. We know of that family that the shad—both *Alosa finta* and *Alosa communis*—ascend in the early part of summer from the sea to the fresh water to spawn; but they seek the sluggish parts of a river, or the quiet waters of the lake, where the ova float, to be impregnated, similar in habit to the herring. The shad has been taken in salmon-nets in the lakes at Killarney, and in rivers in Kerry. Some discussion also arose in the Society that the clean spring fish ascending the Caragh river, in the county Kerry, in January, remained in the fresh water throughout the summer, and spawned the following autumn without revisiting the sea before spawning. It is necessary, for the proper development of the ova and milt, that the fish should be in the healthiest state of vigour; consequently a sojourn in the fresh water for so many months must greatly deteriorate the condition of the fish, and render them unequal to such important functions. The wild and romantic districts in Kerry, which supply the waters of the Laune and the Caragh, have for years been familiar to me. Its salmon-fisheries, therefore, would naturally interest me. Salmon are found ascending the Caragh very early in the autumn for the spawning-beds, being at that time, in August and early in September, with the ova largely developed. These are the early breeding fish, and subsequently are the run of early spring salmon. After the operations are completed in the spawning-beds, the fish return to the sea to recruit, and are again to be met early in January, in the fresh water, in the prime condition. These fish do not then visit the river or lake for the purpose of spawning, nor remain until

that time approaches, for salmon do not at all times enter the rivers for the object of breeding. Seasons and localities alone influence the salmon to proceed to the spawning-beds, according to the condition of the early and late breeding fish. Mr. Shaw's experiment proves that the salmon which he captured for the purpose of obtaining the ova for artificial impregnation, and placed in ponds after he had successfully effected the object, on being liberated from the ponds at once moved towards the sea. Frequent remarks have been advanced, that to the destructive floods of 1848 and 1849 were to be attributed the scarcity of salmon the following years. I was on the South-west coast in the season of 1849 and 1850. Our salmon-fisheries in the Feohanagh and the Clehane were complete failures in 1850, and there certainly was a scarcity of peal that season. Our western rivers are very late, and salmon do not in the generality of them approach until late in the season. After the season had closed the salmon were plentiful in the estuaries, and this was strikingly the case late in the season of 1850, for great quantities of fish were hanging about the mouths of the rivers, unable or uninclined to ascend until very late in the season. The season of that year was uncommonly dry, and the rivers were low the greater part of the autumn; and it was not until October that the fish entered the rivers. At that time I heard that those that were taken were in prime condition. On inquiries the same season I found that similar causes to some extent affected the Lee and the Slaney, and that long after the season had closed the salmon were to be found going up the rivers, and in prime condition. This went far to prove that in some of those late rivers the season closes much too early (at least for the rod), and on the other hand the season should not commence too early. Again, there are exceptions, for in some rivers there is a good run of clean fish the greater part of the year. It is quite clear that salmon do not desert the rivers of their origin, for whatever natural causes may induce or oppose their earlier or later ascent from the sea, they invariably seek the parent stream. Their visits to the sea are confined to those depths off the coast where the river disembogues, and where rocky ledges and sandy and shingly channels afford protection, and abundance of marine animals for the proper nourishment of their rapid growth. Experience has proved to me the unsound views advanced of the migration of fish. Cod, ling, haddock, hake, pollock and herrings are throughout the year in the deep water, their proper feeding-grounds bordering the parts of the coast, and the bays and estuaries, where they each season approach to spawn. All oviparous fish visit the shouler parts of a coast to spawn, and those periods are now the seasons of the fishermen's harvest. An experimental cruise in 1850 proved the correctness of these views. On proper sounding-grounds off the coast the finest ling and cod were taken long after the usual season was over, thus fully bearing out the statements that had been made to the late Admiral Sir Thomas Ussher and to the Earl of Clarendon. My friend James Edw. Stopford, Esq., in connexion with the Royal Irish Fisheries Company, is now on the South-west coast working out more extensively these trials. In these inquiries it is difficult to overcome the prejudices and habits of the coast fishermen: educated only in the knowledge of their fathers, they are hostile to any innovation of that knowledge, and therefore cannot comprehend the views of the practical naturalist, to learn accurately the nature of the soundings, the marine animals, the characteristics of and distribution of fish, which all tend to arrive at information so necessary with regard to the feeding, the spawning-grounds, and the habits of animals connected with so important a branch of resource. In concluding, these observations must only be considered general, as it is my intention to enter more minutely into the distinctive

details that characterise the Salmonidæ. I have to regret, however, the absence of Mr. Ffennell, whose able assistance would have been valuable on this subject, which he had started in the Society and invited it to the discussion. It is a subject also that requires the aid of the sound judgment of the practical men of the great Scotch fisheries."

The Chairman said that the salmon-fisheries of Ireland had for some years past excited great and general interest, yet it was a subject that appeared not to have been understood. He would be glad to hear any remarks from the Members upon the statements which Mr. Andrews had submitted.

Wheatears feeding on Flies; &c.

Doctor Farran wished to offer a few observations prior to the adjournment of the Society for the summer recess. Ornithological facts, with the exception of Mr. Andrews' highly interesting paper on the membranaceous duck of Australia, had occupied the attention of the Society very briefly during the late meetings; but he trusted a large accumulation of such would be in store for the ensuing session. He thought the following notes might prove interesting:—Walking on the shore of Knockaginn, on the 3rd of April, 1854, he (Dr. Farran) saw eight or ten male wheatears (*Saxicola Œnanthe*), in fine plumage, sitting on a little eminence or sand-hill. It being a fine sun-shining day flies were abundantly about, on which the wheatears were feeding in the manner of the flycatchers, capturing the insect on the wing, and immediately returning to the spot they left. They appeared fearless, suffering you to approach within five yards, and remaining motionless until attracted by their prey. It would appear, from such a number of male birds being together, that they preceded the females in their migration. Another fact was the almost total disappearance of the brent goose (*Anser Brenta*) from the Dublin markets. This bird, erroneously named bernicle, has hitherto been abundant, and much esteemed for its flavour. The winter was very severe, which usually brings them in numbers to our shores. The cause of their disappearance should be inquired into.

Honorary Members.

The Chairman then announced that the ballot should take place. There were the names of some distinguished men that had been approved of by the Council to be nominated Honorary Members. He should mention that it was a rule of the Society that "No person residing in Dublin, or within ten miles of it, can be elected as an Honorary Member of the Society."

Annual Dinner.

Mr. Andrews, one of the Secretaries, then stated that this meeting closed the session for the season. The Society in its objects had endeavoured, throughout the past session, to bring before its meetings subjects, original, useful and instructive, and more especially of value in practical points. The mere collecting of the objects of the natural history of a country, or the records of their existence, are but limited stages in the advance of the science; our powers should be bent to trace causes of existence, and the results useful and practical derivable from such causes. He trusted that during the recess the Members would aid these objects of the Society. He also mentioned

that it was proposed that the usual annual dinner should take place, of which due notice would be given to the Members.

Election of Members.

The Chairman then announced that the following gentlemen had been unanimously elected Honorary Members:—Colonel Sabine, F.R.S., President of the British Association; Thomas Bell, Esq., F.R.S., President of the Linnean Society; Sir William Jackson Hooker, K.H., &c., Director of the Royal Botanic Gardens, Kew; Edward Newman, Esq., President of the Entomological Society; J. O. Westwood, Esq., Ex-President of the Entomological Society; Joshua Alder, Esq.; and — Martin, Esq., Dublin, Ordinary Member.

The session was then adjourned to November.

Proceedings of Natural-History Collectors in Foreign Countries.

MR. A. R. WALLACE. — “Singapore, May 9, 1854. — As I have no doubt that my entomological friends will be glad to hear that I have arrived safe, and have commenced work, I will give you a short account of my progress up to this time.

“I landed at Singapore on the 20th of April, after a 46 days’ passage from England without any incident out of the common. For a week I was obliged to remain in the town at an hotel, not finding it easy to obtain any residence or lodging in the country. During this time I examined the suburbs, and soon came to the conclusion that it was impossible to do anything there in the way of insects, for the virgin forests have been entirely cleared away for four or five miles round (scarcely a tree being left), and plantations of nutmeg and *Oreca* palm have been formed. These are intersected by straight and dusty roads; and waste places are covered with a vegetation of shrubby *Melastonias*, which do not seem attractive to insects. A few species of *Terias*, *Cethosia*, *Danais* and *Euplœa*, with some obscure *Satyridæ*, are the only butterflies seen, while two or three lamellicorn beetles on the *Acacia* trees were the only *Coleoptera* that I could meet with.

“At length, however, I obtained permission to reside a few weeks at a Roman Catholic mission near the centre of the island, from which place, called ‘*Bakit Tima*,’ I now write. Here portions of the forest, which originally covered the whole island, and which is rapidly disappearing, still exists, and it is in them that I find my only good hunting-grounds.

"From the highest point in the island near here (only 500 feet) a good view is obtained of the plantations which are everywhere formed by the Chinese for the cultivation of pepper and gambic; and it is apparent that but few years can elapse before the whole island will be denuded of its indigenous vegetation, when its climate will no doubt be materially altered (probably for the worse), and countless tribes of interesting insects become extinct. I am therefore working hard at the insects alone for the present, and will give you some little notion of what I have done and may hope to do.

"First, then, in Lepidoptera I have been tolerably successful, having in about twelve days obtained 80 species of Diurnes. If other localities prove equally rich I think the Eastern Archipelago may not fall much short of S. America. I have already about 30 species of Lycænidæ and Ericinidæ, some of which I have no doubt will prove new. Among the larger species the most remarkable is a magnificent Idæa, which is abundant in the forest, sailing or rather floating along, and having to my eye a far more striking and majestic appearance than even the Morphos of Brazil. It was a great treat to me to behold them for the first time, as well as many other of the Eastern forms to which I had pretty well familiarised my eye in collections at home. The Euplœas here quite take the place of the Heliconidæ of the Amazons, and exactly resemble them in their habits. I have taken the singular Danais Daos, *Doub.*, figured by Boisduval as an Idæa, which it exactly resembles in its colour, markings and flight; indeed there are small specimens of the Idæa from which it cannot be distinguished till captured, yet it is certainly a true Danais. The Leptocercus Currius is not uncommon here; it is a Papilio Protesilaus in miniature. Of true Papilios I have only four common species, and one of the group resembling Euplœa, which may prove new.

"I must now turn to the Coleoptera. I am delighted with them; for though all small at present, they are exceedingly beautiful and interesting. I have 6 species of Cicindelas, all small; 13 Carabidæ, mostly minute, but very beautiful; 10—12 Cleridæ; about 30 very small Curculionidæ; and, *mirabile dictu!* 50 species of Longicornes, and it is only ten days since I took the first. Imagine my delight at taking 8 to 10 a day of this beautiful group, and almost all different species; but the worst of it is that I have got into a place where there are many woodmen and sawyers at work, and it is in the neighbourhood of the fallen timber that I get most of them, on the wing. Almost all are small, few exceeding an inch and many not much more than a line. Under Boleti I have found some extraordinary Erotylidæ.

The Elaters and Paprentidae are all very small, as well as the Chrysomelidae and other small groups. In all I have now 250 species, which will increase daily, but at a slower rate.

"In the other orders there is nothing very remarkable. Hemiptera, as well as bees and wasps, are very scarce. Tenthredinidae are rather abundant. Of dragon-flies I have many pretty species, and the Diptera are plentiful and very curious. I have taken a species (of the genus *Diopsis* I believe) with telescopic eyes, and some other singular forms. Ants are very abundant, also scorpions and centipedes, but these I do not seek after.

"In the midst of this entomological banquet there is, however, one drawback—a sword suspended by a hair over the head of the unfortunate flycatcher: it is the possibility of being eaten up by a tiger! While watching with eager eyes some lovely insect, the thought will occasionally occur that a hungry tiger may be lurking in that dense jungle immediately behind intent upon catching you. Hundreds of Chinamen are annually devoured. Pitfalls are made for the animals all over the country; and in one of them, within two miles of our house, a tiger was captured a short time before my arrival. Only last night a party of Chinamen, going home to their plantation, turned back afraid, having heard the roaring of a tiger in the path. These are unpleasant reminders of the proximity of a deadly foe; and though perhaps the absolute danger is little enough, as the tiger is a great coward and will not attack unless he can do it unawares, yet it is better to have the mind quite free from any such apprehensions. I shall therefore most probably leave here in a month or so for Borneo, before which, however, I hope to make such a collection as to give a tolerably correct idea of the Entomology of Singapore."

MR. H. W. BATES.*—"Santarem, January 18, 1854.—Although I have no collection to forward this month, and nothing very important to say, I write you to convey my great gratification at the receipt, a few days ago, of the two missing parcels sent by you; not only the one sent in May last, but also the long-lost one of May, 1852, containing the water-colours, &c., &c.; all quite complete and undisturbed; they have been lying at the Custom-House in Pará, on account of no one making application for them. I believe now I have received everything you have sent me up to this time. In December I sent you the collection I had made in a three months' sojourn up the

Communicated by Mr. S. Stevens.

Tapajos, &c., and I hear from Parà that it was destined to go in the 'Isabella Scott,' to sail on the 4th of January. Amongst its contents is a large number of new species of all orders, and some very nice series of new and rare species of Erycinidæ. I had indicated a number of sexes paired in the collection; and as far as regards the Lemonias Pythia, and the other plain blue Lemonias, I have since received further confirmation. In my last letter to you I sent notes, and I believe expressed myself disappointed at not receiving some promised sketches and names of my species from our friends; on further reflection, however, I do not see that I have any right to expect it; and moreover, since I received the five Catalogues of the British Museum I find any further assistance from friends by letter quite unnecessary, as far as the departments of which the Catalogues treat. I have lots of curious and I think new observations on the Neuroptera, in almost all the families.

"The rainy season has set in here two months earlier than last year, and with great force: we have deluges of rain. Collecting anywhere else except in the dry campos of Santarem is out of the question: it will very likely clear up earlier, and that will be favourable for ascending the river to Peru. The steamer which struck on a rock in the river, last September, has been freed this week, and will come to Santarem to be repaired: the other steamer will be then disengaged to resume its line on the Upper Amazons to Nanta, and I of course shall take the opportunity. I have just captured several pairs of *Pœcilocephus Batesii* in copulâ. The female has quite a different shaped thorax, rhomboidal, side-angles produced and shining black, more like *Sternacanthus*. I have taken here lots of new species of larger things, but have done nothing at all in minute Coleoptera this season."

M. JULIEN DEBY.*—"Floyd County, United States, March 7, 1854. —You will perhaps have been anxious about me, not having received any tidings of my proceedings since I left Europe, but I will in a very few words explain to you my misfortunes. I was wrecked on the coast of Nova Scotia, losing all my luggage, clothes, money, &c., to the last halfpenny I possessed. I was the only passenger on board the unfortunate ship. I got on to Halifax, where, after working a short time as *gardener*, I collected the necessary sum to take me on to New York, where I hoped to meet some countrymen of mine who might

* Communicated by Mr. S. Stevens.

help me in my forlorn condition. When I reached that town, the persons I hoped to meet had left, some for Europe, and those I best knew for Georgia in the South. I immediately wrote to these last, but receiving no answer determined on rejoining them. I now had a hard time of it; I made myself 'Jack of all trades,' so as to collect the money necessary for the journey. I worked at New York, Philadelphia, Baltimore, Norfolk, Wilmington, Charlestown and Augusta, and after many weeks of hard labour, and harder life than I ever experienced in the midst of the South-American forests, I reached Rome, a small town of three thousand inhabitants, and discovered my friends (the Gaussoin family), living twelve miles from there, on a small cotton-plantation. I was received there as a friend. My letter had never reached them; but the position of M. Gaussoin prevented his giving me any pecuniary help, so I determined to stop with him and try and make by my efforts the necessary money to carry me on further South. I am quite determined, as soon as I have the necessary funds, to go on to Central America. I am born for misfortune, I think, but I am not easily discouraged, and am determined to fight the battle of life to the very last, and not to allow myself to be beaten by circumstances. I have been here some weeks now, and in my leisure hours have collected specimens of divers kinds. I am astonished at the richness of the Fauna and Flora of these parts, and have collected many insects which to me seem undescribed. Reptiles (especially Batrachia, as Triton, Salamandra, Rana, and allied genera) and tortoises are very numerous. Do you think I could make some money by insects, reptiles, birds, and land and fresh-water shells? If so, answer me immediately, and I shall set diligently to work. My only aim is making the necessary money to carry me on, and every little helps; small streams make great rivers. I could easily collect four to six thousand insects in a month's time, and a few hundred bird-skins, which the boys would shoot for me, and which I would skin in the evening after the day's work is over.

"Could you not forward me a few thousand entomological pins? I cannot possibly buy them here. All my provision of them and the insect-boxes I had made so carefully are lost. If you could send them by some vessel coming to Charlestown, you might address them to the Belgian Consul in that town, 'to be given to Mr. Camille Le Hardy.' This gentleman I know, and he will forward them to me. I am here in a fine, hilly, well-watered and very well-wooded country, but the plantations are few and far between; and some good-sized marshes in the midst of the woods are the resort of many rare animals.

I cannot help thinking that collecting here would pay, as very few naturalists, so far as I know, have ever visited this part of Georgia.

"Have MM. Botteri and Hoffman reached their respective destinations safely?—how I envy them.

"Did the reptiles I sent you from Belgium, on the eve of my departure, ever reach you?

"I shall soon write a longer letter, giving you some curious details on what I have observed in the Natural History of this county. I have an opportunity for the post to-day, which I fear losing if I continue writing. I hope you will pity me and my misfortunes. Be assured that as long as there is life in me I shall not lose courage or my passionate love for Natural History."

NOTICES OF NEW BOOKS.

'*The Annals and Magazine of Natural History.*' No. 79, dated July, 1854; price 2s. 6d. London: Taylor & Francis, Red Lion Court, Fleet Street.

This number contains the undermentioned papers:—

'On the Genus *Lycium.*' By John Miers, Esq., F.R.S., F.L.S., &c.

'Additions and Corrections to the Arrangement of the Families of Bivalve Shells.' By J. E. Gray, Ph.D., F.R.S., V.P.Z.S.

'Supplement to a Catalogue of British Spiders, including Remarks on their Structure, Functions, Economy and Systematic Arrangement.' By John Blackwall, F.L.S.

'On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.' By Thomas Williams, M.D. Lond. (With two plates.)

'Notes on the Ornithology of Ceylon, collected during an Eight Years' Residence in the Island.' By Edgar Leopold Layard, F.Z.S., C.M.E.S., &c.

'On Manufactured Sea-Water for the Aquarium.' By P. H. Gosse, A.L.S.

Proceedings of Learned Societies:—Royal—Zoological—Royal Institution.

Miscellaneous:—On the Formation of the Stomata in the Epidermis of the Leaves of the Spiderwort (*Tradescantia virginica*), and

on the Evolutions of the Cells in their Neighbourhood; by Dr. Garreau. Description of a New Genus of Bivalve Mollusca; by H. and A. Adams. On the Dimorphism of the Uredineæ; by M. Tulasne.

Mr. Gosse's suggestion for making a substitute for sea-water will be found useful, on account of the expense and trouble it must necessarily save. Impressed with the difficulties attending the usual method of supply, he says, "I determined to try the matter for myself. I took Schweitzer's analysis, but as I found that there was some slight difference between his and Laurent's, I concluded that a minute accuracy was not indispensable. Schweitzer gives the following analysis of 1000 grains of sea-water taken off Brighton:—

Water	964·744
Chloride of sodium	27·059
Chloride of magnesium	3·666
Chloride of potassium	0·765
Bromide of magnesium	0·029
Sulphate of magnesia	2·295
Sulphate of lime	1·407
Carbonate of lime	0·033
	<hr/>
	999·998

"The bromide of magnesium and the carbonate of lime I thought I might neglect, from the minuteness of their quantities; as also because the former was not found at all by M. Laurent in the waters of the Mediterranean; and the latter might be found in sufficient abundance in the fragments of shell, coral, and calcareous Algæ, thrown in to make the bottom of the aquarium. The sulphate of lime (plaster of Paris) also I ventured to eliminate, on account of its extreme insolubility, and because M. Laurent finds it in excessively minute quantity. The component salts were then reduced to four, which I used in the following quantities:—

Common table salt	3½ ounces.
Epsom salts	½ ounce.
Chloride of magnesium	200 grains, Troy.
Chloride of potassium	40 " "

To these salts, thrown into a jar, a little less than four quarts of water (New River) were added, so that the solution was of that density that a specific gravity bubble 1026 would just sink in it.

"The cost of the substances was—sulph. mag., 1*d.*; chloride mag., 3*d.*; chlor. pot., 1½*d.*; salt, nil; total 5½*d.* per gallon. Of course if a larger quantity were made the cost of the materials would be diminished, so that we may set down 5*d.* per gallon as the maximum cost

of sea-water thus made. The trouble is nothing, and no professional skill is requisite.

"My manufacture was made on the 21st of April. The following day I poured off about half the quantity made (filtering it through a sponge in a glass funnel) into a confectioner's show-glass. I put in a bottom of small shore pebbles, well washed in fresh water, and one or two fragments of stone with fronds of green sea-weed (*Ulva latissima*) growing thereon. I would not at once venture upon the admission of animals, as I wished the water to be somewhat impregnated with the scattered spores of the *Ulva*; and I thought that if any subtle elements were thrown off from growing vegetables, the water should have the advantage of it before the entrance of animal life. This, too, is the order of nature; plants first; then animals."

'Transactions of the Entomological Society of London.' New Series.
Vol. III., Part 1. Demy 8vo., 56 pp. letter-press; 3 plates.
Price 3s. 6d. London: Longman. 1854.

The papers in this part are intitled—

'Notice of a Sack-bearing Bombyx, found by Mr. Bates near Santarem, in the Amazons.' By Edward Newman, Imp. L.C. Acad. Memb., F.L.S., &c.

'Description of a New Species of *Lithocolletis*.' By John Scott, Esq.

'Critical Remarks upon the British *Elateridæ*, with Descriptions of some of the Species.' By John Curtis, Esq., F.L.S., &c.

'Some Observations on the Excrement of Insects; in a Letter addressed to William Spence, Esq., F.R.S., &c.' By John Davy, M.D., F.R.S., Inspector-General of Army Hospitals.

'Descriptions of some *Coleopterous Larvæ*, &c.' By John Curtis, Esq., F.L.S., &c.

'Observations on the Economy of *Pompilus punctum* and other *Hymenoptera*.' By F. Smith, Esq.

'Descriptions of a New Species of *Ichneumon*.' By Thomas Desvignes, Esq.

'Characters of undescribed *Lucanidæ*, collected in China, by R. Fortune, Esq.' By W. Wilson Saunders, Esq., &c.

'*Transactions of the Tyneside Naturalists' Field Club.*' Vol. II., Part 3. Demy 8vo., 38 pp. London: Simpkin. 1853.

The papers in this part are intituled—

'Address to the Members of the Tyneside Naturalists' Field Club.' By the President, Dr. Thorp, Archdeacon of Durham, &c.

'Journal of an Excursion into Northumberland, in June and July, 1851.' By James Hardy.

'Observations on the Nidification of *Gasterosteus aculeatus* and *Gasterosteus spinachia*.' By Albany Hancock.

'Notes on the Fifth Field Meeting, held at Otterburn, on the 2nd and 3rd of September, 1852.' By William Kell, Esq., F.A.S.

The paper of most general interest, that on the nidification of *Gasterosteus aculeatus*, we have transferred to the '*Zoologist*:' the writer should, we think, have referred to Mr. R. Q. Couch's admirable and minutely accurate paper on the same subject in the '*Zoologist*,' published in 1844 (*Zool.* 795). The passage commencing "On several occasions" and ending at "as long as I remained" is a *verbatim* and *literatim* reprint from the '*Zoologist*.'

'*Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.*' By HENRY and ARTHUR ADAMS. Parts XI.—XIV. London: Van Voorst. March—June, 1854. Each Part contains 32 pages of letter-press and 4 plates; price 2s. 6d. Demy 8vo. plain, 5s. Royal 8vo. coloured.

Part XI. comprises the following genera:—*Planaxis*, Lamarck; *Quoyia*, Deshayes; *Holcostoma*, H. and A. Adams; *Litiopa*, Rang; *Rissoella*, Gray; *Hyala*, H. and A. Adams; *Rissoina*, D'Orbigny; *Rissoa*, Fréminville; *Alvania*, Risso; *Onoba*, H. and A. Adams; *Barleeia*, Clark; *Ceratia*, H. and A. Adams; *Setia*, H. and A. Adams; *Cingula*, Fleming; *Hydrobia*, Hartmann; *Amnicola*, Gould and Haldeman; *Vivipara*, Lamarck; *Paludomus*, Swainson; *Tanalia*, Gray; *Bithynia*, Leach; *Nematura*, Benson; *Valvata*, O. F. Müller; *Ampullaria*, Lamarck; *Pomus*, Humphrey; *Marisa*, Gray; *Pomella*, Gray; *Ianistes*, Montfort; *Meladomus*, Swainson; *Asolene*, D'Orbigny; *Turritella*, Lamarck; and *Torcula*, Gray.

Part XII. comprises the following genera :—Zaria, *Mesalia* and *Eglisia*, *Gray*; *Cæcum*, *Fleming*; *Siphonium*, *Browne*; *Vermetus*, *Adanson*; *Bivonia*, *Gray*; *Serpulorbis*, *Sassi*; *Cladopoda*, *Gray*; *Spiroglyphus*, *Daudin*; *Tenagoda*, *Guettard*; *Onustus*, *Humphrey*; *Xenophora*, *Fischer*; *Calyptra*, *Humphrey*; *Crucibulum* and *Trochita*, *Schumacher*; *Galerus* and *Crypta*, *Humphrey*; *Capulus*, *Montfort*; *Amathina*, *Gray*; *Cochlolepas*, *Klein*; *Vanikoro*, *Quoy & Gaimard*; *Neritopsis*, *Grateloupe*; *Nerita*, *Linneus*; *Neritella*, *Humphrey*; and *Clithon*, *Montfort*.

Part XIII. comprises the following genera :—*Catillus*, *Humphrey*; *Eutropia*, *Humphrey*; *Turbo*, *Linneus*; *Senectus*, *Humphrey*; *Lunella*, *Bolten*; *Modelia*, *Gray*; *Prisogaster*, *Mörch*; *Callopoma*, *Ninella* and *Collonia*, *Gray*; *Astraliun*, *Link*; *Stella*, *Klein*; *Guildfordia*, *Uvanilla*, *Pachypoma*, *Lithopoma* and *Pomaulax*, *Gray*; *Cookia*, *Lesson*; *Bolma*, *Risso*; *Liotia*, *Gray*; *Cyclostrema*, *Marryatt*; *Adeorbis*, *Searles Wood*; *Umbonium*, *Link*; *Isanda*, *H. and A. Adams*; *Camitia*, *Gray*; *Chrysostoma*, *Swainson*; *Angaria*, *Bolten*; *Livona*, *Gray*; *Trochus*, *Linneus*; *Cardinalia*, *Gray*; *Tectus*, *Montfort*; *Polydonta*, *Schumacher*; and *Clanculus*, *Montfort*.

Part XIV. comprises the following genera :—*Crospedotus*, *Philippi*; *Monodonta*, *Lamarck*; *Euchelus* and *Diloma*, *Philippi*; *Thalotia*, *Gray*; *Ziziphinus*, *Leach*; *Turcica*, *H. and A. Adams*; *Cantharidus*, *Montfort*; *Eleuchus*, *Humphrey*; *Bankivia*, *Beck*; *Trochocochlea*, *Klein*; *Oxystele*, *Philippi*; *Photinula*, *H. and A. Adams*; *Chlorostoma*, *Swainson*; *Omphalius*, *Philippi*; *Monilea*, *Swainson*; *Gibbula*, *Leach*; *Trochiscus*, *Sowerby*; *Margarita*, *Leach*; *Vitrinella*, *C. B. Adams*; *Stomatella*, *Lamarck*; *Stomatia*, *Helbling*; *Microtis*, *A. Adams*; *Gena*, *Gray*; *Broderipia*, *Gray*; *Anatomus*, *Montfort*; *Haliotis*, *Linneus*; *Teinotis*, *H. and A. Adams*; *Padollus*, *Montfort*; *Fissurella*, *Bruguière*; *Lucapina*, *Gray*; and *Clypidella*, *Swainson*.

'A Manual of Natural History, for the use of Travellers; being a Description of the Families of the Animal and Vegetable Kingdoms: with Remarks on the practical study of Geology and Meteorology. To which are appended Directions for Collecting and Preserving.' By ARTHUR ADAMS, M.R.C.S.; F.L.S.; M.E.S., Stettin; WILLIAM BALFOUR BAIKIE, M.D., F.B.S.E., late one of the Presidents of the Royal Medical Society of Edinburgh; and CHARLES BARRON, Curator of the Royal Naval Museum at Haslar. London: John Van Voorst, Paternoster Row. 1854. Post 8vo; 750 pages. Price 12s.

We cannot better give the view which the authors have in publishing this work than in citing their preface entire.

"The design of the following pages is to endeavour to supply what seems to be a blank in the scientific literature of this country, for, although numerous treatises exist upon every branch, yet no work has hitherto appeared, comprising either succinctly or in detail, a comprehensive outline of Natural History. It may appear presumptuous on the part of the Authors to attempt to grapple with such an extensive range of subjects, which they feel must be, in many instances, inadequately treated, still they trust that their effort to condense, within the limits of a portable volume, the leading features of Animate and Inanimate Nature, may prove of service to those at least for whom it is more especially intended. Their chief aim has been to render their work at once sufficiently popular for the general reader, without, at the same time, lessening its scientific value. For this purpose technicalities have been avoided whenever their employment could be dispensed with, English names have been given to all the Classes, Orders, and Families, and the principal divisions have been prefaced by brief introductory remarks. The classification adopted is that which has seemed most closely to accord with the advanced views of the time; and throughout the Animal and Vegetable Kingdoms a uniform system has been employed, so that similar subdivisions are designated by a cognate nomenclature."

'*The Microscope and its Application to Clinical Medicine.*' By LIONEL BEALE, M.B. Lond., Professor of Physiology and Morbid Anatomy in King's College, London. Post 8vo, 304 pp. letter-press, 1 plate, and numerous illustrations on wood. Price 10s. 6d. London: Highley, 1854.

We think this a useful book, but not perhaps exactly in our peculiar department of science. "A short course of lectures which was given in the Spring of 1853 forms the basis of the volume. To the notes, which had been prepared, and which the author had originally intended to print for the use of his pupils, much has since been added; and it is hoped that in its present shape the work may afford some assistance to practitioners and students in medicine who employ the microscope in clinical investigation or in physiological and pathological inquiries.

"In the present day this branch of investigation is being pursued by all who are most anxious to increase our knowledge of the structural alterations taking place in disease, and of adding to our information with reference to some of those important processes which interfere with the due performance of the healthy functions of different organs—investigations in which all may find ample employment, and may thus contribute to the advancement of the true interests of their profession, and aid in the elucidation of truths which may ultimately promote the interests and welfare of mankind in a degree not less than they will add to the advancement of science."—*Preface.*

So writes the author: we have only to add that we heartily recommend the book as one of the careful essays that always benefit that branch of science of which they particularly relate.

Reply to Mr. Birkbeck's "Remarks on a List of Birds of West Cumberland," by Mr. Joseph Robson, addressed to Walter Buchanan, Esq., F.L.S.—In the 'Zoologist,' (Zool. 4366), I observe you are expected to answer a few inquiries respecting some extraordinary statements in "A List of the Birds of West Cumberland," (Zool. 4166). As the list was compiled by me, from, I fully believe, most authentic sources of information, I will feel obliged if you will communicate to Mr. Birkbeck, through the 'Zoologist,' the following statement, which I have no doubt may be relied upon.

Swallow-tailed Kite (*Elanus furcatus*), shot in Eskdale, Cumberland, spring of 1853.

Description.—For details see Yarrell.

Time of capture.—April; exact date not known.

Name and address of the person who shot it.—William Lister, joiner, late of Eskdale, now in Australia.

Name of its present possessor.—Mr. Harrison, ironmonger, Strand Street, Whitehaven.

Details of the circumstances under which it was obtained.—First seen in company with peregrine falcons, by a man named Graham: about two weeks afterwards Lister discovered its roosting-place, and made several ineffectual attempts to shoot it: he then fixed his gun into a wall (the dry boulder sheep-walls of the district), and thus covered the eyrie, situated in a crevice of a crag; returning at midnight he discharged his gun, and on the following morning found his shot had told: yes—with all due regard for the opinions of others on the aids to and furtherance of science, and the requirements of collectors, I venture to regret—it had told too well, since, although of extremely rare occurrence, it is very possible there may be others in the country with which it might have mated.

I was lately informed by a military gentleman—a crack shot, and well acquainted with native birds, yet no collector, and who long resided with his regiment in Canada—that a few years ago he rarely, for a long period, took his morning walk without seeing a specimen of the swallow-tailed kite, and in this immediate neighbourhood: he described its peculiar flight, and was certain of its identity. I am also credibly informed that a ship captain brought a pair alive from New Orleans to Liverpool, at a much later date than the above, but I am unable to state what became of them. With respect to the birds inquired about, they certainly are not so common as to be of every-day occurrence in chosen localities, yet that they may be procured at intervals here and there is a fact pretty well known to many collectors. During the severe weather of last winter, the little gull and many other northern sea-birds were frequently seen about St. Bees' Head: the merganser was shot on Ennerdale Lake. Two specimens of the little bittern have been shot in this neighbourhood lately. A month ago a swan passed southward over this town, flying very low. I now have to record a visitor perhaps quite as rare in this district as the *Elanus*. A specimen of the great bustard was killed lately near Wigton, and, although without details at present, I have most excellent authority for its truth, and believe it the only instance on record of this bird having been seen in Cumberland. In conclusion, I have to remark, that for the circumstances, names, &c., relating to the capture of the *Elanus*, I am indebted to the possessor, who refers me to Yarrell for a correct detailed description of the bird.—*Joseph Robson; Whitehaven, July 17, 1854.*

Occurrence of the Honey Buzzard (Falco apivorus) in Norfolk and Suffolk.—A fine specimen of this rather scarce bird was shot at Holkham, in Norfolk, on the 4th of July; and about the same time another was obtained near Saxmundham, in the adjoining county. On examination both proved to be females, the first being the oldest bird, having attained the ash-gray plumage on the head, often described as a variety under the name of the "capped buzzard." The stomachs of both these birds were well filled with young wasps, in different stages of growth, and in that of the Suffolk specimen a few pieces of moss, which had no doubt been accidentally swallowed during the destruction of the wasps' nest.—*H. Stevenson; Norwich, July 12, 1854.*

Note on a Bustard killed in Cumberland.—A very fine female of the great bustard (*Otis tarda*) was shot on the 8th of March last, in a turnip-field, at Leeshill, parish of Lanercost, Cumberland, and is now in the possession of Mr. Joseph Mowbray, innkeeper, Brampton. It is said to have been in good condition, and weighed 11 lbs.—*Thomas John Bold; Angas' Court, Bigg Market, Newcastle-on-Tyne, July 3, 1854.*

Note on the late appearance of the Common Scoter (Anas nigra) in Norfolk.—Under a similar heading (Zool. 3989), I recorded the occurrence of three specimens of this bird unusually late in the season, the last being on the 20th of June, 1853. A few days since I saw in the flesh a young male, shot on the Norwich river, near Surlingham, on the 1st of this month: this bird was just beginning to assume the dark plumage of the adult male, and would, I should think, agree with the occasional stragglers seen, according to Yarrell, between June and July, outside the rocks of the Isle of White and in Christchurch Bay, supposed by him to be birds "only 12 or 14 months old, that would remain unable to breed till the following summer."—*H. Stevenson; Norwich, July 10, 1854.*

Occurrence of Larus Sabinei, Leach, in Sussex.—During the severe frost in December, 1853, a specimen of this bird, apparently near the completion of its second year, was shot at Newhaven, Sussex, by the gardener of Mr. Catt, of the Tide Mills, near that town. I examined it very carefully, and found it to agree closely with the description by Mr. Thompson, quoted by Mr. Yarrell in his 'History of British Birds,' vol. iii. p. 425. It is now in the possession of Mr. Wm. Catt, of Brighton. The measurement was as follows:—

	in. lin.
Length from tip of bill to tip of longest tail-feather . . .	12 10
" " to centre of fork of tail . . .	11 0
" from carpus to end of wing	10 5
" from tip of bill to feathers above nostrils . . .	0 10
" " to gape	1 $\frac{1}{2}$
" of naked part of tibia	0 7
" of tarsus	1 2
" of middle toe, with claw	1 $\frac{1}{10}$
" of claw of middle toe	0 1
Depth of fork of tail	1 0
Extent of wing beyond longest tail-feathers	1 4

—*Wm. Borrer, jun.; Cowfold, Sussex, July 7, 1854.*

Occurrence of the Continental White Wagtail (Motacilla alba) in Sussex.—A male and a female of this species were shot on the 6th of April last, near the Chalybeate, in the parish of Hove, near Brighton, and brought to me by G. Swaysland, of Cranbourne Street, Brighton, before they were skinned: he told me that he shot them near some ploughed land, that they did not follow the plough like *M. Yarrellii*, that they were much wilder, and that they had a hoarser note. On the 8th, another bird-preserver, H. Pratt, of Queen's Gardens, Brighton, brought me a female, a last year's bird, also in the flesh, which he had shot near the same place, on the same day; and on examination of this specimen I found that the eggs were only just formed, or at least showed but slight development. Swaysland has told me that that was the state also of the ova in his specimen. On reference to my note in the 'Zoologist,' (Zool. 3908), I find the same observation respecting a specimen obtained still later in the year, April 19, 1853. In the male specimen obtained by Swaysland, in April of the present year, is a curious malformation, there being on one foot two perfectly formed and very nearly similar hind toes: the other foot is as usual. I have little doubt, as the bird is now known, that this species will be found to be a regular summer visitant to our South coast.—*Id.*

Observations on the Nidification of Gasterosteus aculeatus and Gasterosteus spinachia. By ALBANY HANCOCK.*

It is only within the last few years that naturalists have clearly determined that some species of fish make nests for the reception of their spawn, though Aristotle was actually acquainted with the fact about twenty-two centuries ago.

Five or six kinds are now ascertained to nidify; and of these, two belong to the genus *Gasterosteus*; one, *G. aculeatus*, the three-spined stickleback,—the other, *G. spinachia*, the fifteen-spined stickleback. The former is a well-known, active, and pugnacious little fish, inhabiting almost every pool and rivulet in the kingdom; the latter is much rarer, and is a denizen of the sea.

Mr. Jonathan Couch states, in his interesting work entitled 'Illustrations of Instinct,' that the first detailed notice of the nest-building of the three-spined stickleback occurs in a little magazine 'The Youth's Instructor,' for the year 1834. This notice is from the pen of Mr. T. Crookenden, a gentleman unknown as a naturalist, but who has given a very faithful account, so far as it goes, of the nidification of this species. It contains all that is at present known on the subject, and its accuracy can be verified by any one who will take the trouble to look into almost any pool of water during the summer months,—the breeding-season of the stickleback. At this time these fish will be observed near to the margins, busily engaged in building and guarding their nests; and shoals of the fry may be seen, in different stages of development, swimming about in all directions. But if we wish to study, to advantage, the nidification of this species, a few specimens should be placed in confinement about May or June, and then all their movements can be narrowly watched and accurately observed. Care must be taken, however, that they be left unmolested, and that their new abode resemble, as much as possible, their usual haunts. I have lately had an opportunity of noticing the habits of this fish, during the breeding-season, under the above favourable conditions.

We have, for some time past, kept a glass trough filled with aquatic plants and animals: the bottom of this vessel is covered with mud, and the rock-work, piled up in the centre, is overgrown with a delicate

* Extracted from the 'Transactions of the Tyneside Naturalists' Field Club,' vol. ii. p. 311.

hair-like Conferva; a few floating plants spread over the surface of the water, and innumerable Entomostraca, and other small Crustaceans, as well as various animalcules, swarm in all parts; the minute, but deadly, poison-armed Hydra also prevails where food is so plentiful; and a solitary individual of the great water-beetle (*Dytiscus marginalis*) rambles over its watery domain, lord and master of all. Several of the fresh-water Mollusca also people the trough, which on the whole has much the appearance of a miniature pond. Into this new home were put four or five sticklebacks last May, and they at once made themselves perfectly at ease. One, without the least hesitation, took possession of a certain spot, which it guarded with the greatest pertinacity, attacking vigorously any of its companions that might happen to approach the chosen locality. The beetle too, which sometimes came slowly paddling by, was pounced upon and unceremoniously tumbled over; but secure within his scaly armour, as the knights of old, he little heeded the onslaught of his naked assailant; so, overpowering all opposition, he scrambled onward in his undeviating path.

This fish was rather small, had the throat of a bright red colour, and the eyes of a brilliant bluish green. At first, all the others were pale; but in the course of a few days, one of them gradually assumed the rich hues of that just described, and soon afterwards it also became attached to a spot, taking up its abode in one of the corners of the trough. On examining attentively the two selected localities, a nest was found in each, composed of a collection of delicate vegetable fibres, resting on the bottom of the trough, and matted into an irregularly circular mass, somewhat depressed, and upwards of an inch in diameter; the top being covered over with the same materials, and having in the centre a large hole. The fishes scarcely ever strayed from their nests, but were constantly on guard, defending or repairing them; they were perpetually prying into the hole at the top, and thrusting their heads right into it. On one occasion, one of them entered by this hole, and slowly forced itself right through the side of the nest; as it gradually moved onwards, its body had a peculiar lateral vibratile motion. They would frequently seize hold of the nest and give it a violent tug, shaking and tearing loose the vegetable matter of which it was composed; at other times they would carry to it, in their mouths, fine Conferva-stems, and press them with considerable force into the walls of the nest, or thrust them into the hole, which by this means was sometimes partially concealed. Occasionally, each was observed hovering over its nest, with the head close to

the orifice, the body being inclined upwards, at an angle of about 45° , fanning it with the pectoral fins, aided by a lateral motion of the tail. This curious manoeuvre was apparently for the purpose, so to speak, of ventilating the spawn, which could be distinctly seen through the orifice at the top; at least, by this means, a current of water was made to set in towards the nest, as was rendered perfectly evident by the agitation of particles of matter attached to it. This fanning or ventilating process was repeated, at short intervals, during the day, and every day until the spawn was hatched, to accomplish which took between two and three weeks.

Only one nest contained spawn; the other was torn in pieces, and the materials scattered about, in the hope that we might have the pleasure of seeing it reconstructed. In this we were not disappointed; the fish immediately began to form a new nest in exactly the same spot, and by the following day it was more than half completed. It took a mouthful at a time, and was at some pains in adjusting each load, spreading the materials out, and pressing them down with its mouth; it then drew its body slowly over the whole, vibrating, all the time, in the same peculiar manner as when it forced its way through the nest as before stated.*

On the 13th of June, the hole at the top of the fruitful nest was found to be much enlarged, so that the entire mass of spawn was exposed to view; and, on looking attentively, a few of the newly hatched fry were seen flitting about the walls of the nest. The assiduity of the parent was now greatly increased; it never left the spot; by night it rested either on the nest or by its side, and during day nothing was allowed to approach. It fiercely seized a quill that was passed down towards the object of its solicitude, with such vigour that the shock of attack was distinctly felt by the hand. Combats with its companions became more frequent; but its ire was chiefly directed against its neighbour, which, like itself, was engaged in parental duties. This having also a nest to defend, never shrank from the conflict, and the encounters were therefore fierce and prolonged; but, nevertheless, conducted with all due caution, and apparently with much science, as the gentlemen of the ring would express it. The sparring was very wary, and generally lasted a few seconds before the combatants closed. The attack was usually commenced by one

* It is probable that it is the male fish which builds and guards the nest; and, if so, it might perhaps be shedding the milt when dragging its body over and through the nest in the manner described.

quietly creeping up, watching its opportunity; on this the other, acting on the defensive, would turn its broad side to the enemy, and, raising the ventral spine, wait to receive the onslaught; the assailant, intimidated by this formidable demonstration, would then slowly retreat, and in its turn had in the same manner to defend itself. After thus advancing and retreating for a few times, one, taking advantage of an unguarded moment, would rush in upon its opponent and butt at it with its head, apparently endeavouring to bite; the other, rallying, returned the compliment, and after dashing at each other in this way two or three times, with extraordinary rapidity, the round would terminate, and each fish retreat to its nest, to recommence its more immediate nidamental duties.

The fry were at first so minute and transparent that they could scarcely be discerned as they lay partially concealed amid the meshes of the nest: every now and then a slight fluttering motion betrayed their position, otherwise it was almost impossible to distinguish them. As I was closely watching their motions at this time, one of the newly hatched fishlings, with intrepidity beyond its experience, ventured to pass the limits of its cradle: in an instant the watchful parent was there, and with gaping mouth seized the little wanderer, which immediately disappeared, the jaws having closed upon it. Seeing this, I at once gave up the fry for lost, deeming that here was an instance of instinct at fault, and that all the affectionate solicitude of the parent was to end in its devouring its offspring. In this I was mistaken: the old fish, quietly returning, dropped the straggler into its nest lively and uninjured. During the whole of this day none of the fry were permitted to ramble beyond the precincts of their fold; when any attempted to do so—and many did attempt—they were invariably brought back in the mouth of the parent: none escaped its vigilant eye, and it was amusing to see with what a hurried, fluttering motion the little things dropped almost perpendicularly down into the nest, so soon as they were released from the jaws of the parent.

It was three days before all the eggs were hatched, and the attention of the parent, during all this time, was unremitting. On the second day I marked its manœuvres for five minutes, and found that, in this short period, it ventilated the nest eight times, warded off an attack of the neighbouring fish, and brought back to the nest a straggler or two. During this day the spawn was frequently examined by the parent, who would occasionally seize hold of it and give it a good shake; apparently for the purpose of throwing off adherent matter, that the water might freely circulate about the eggs. The parent

would then dive head foremost into the nest, and bring out a mouthful of mud, which it would carry to some little distance and discharge with a puff.

The third day was passed much in the same manner, only as the eggs were now all hatched, the nest was less frequently fanned or ventilated; and the fry, about forty in number, were allowed greater liberty, the strongest being permitted to recreate themselves among the *Conserveæ* that grew on a stone about 2 inches from the nest. On the fourth day the fanning had ceased altogether, and the rambles of the young were less restricted. They were not yet, however, permitted to pass beyond certain limits; when any transgressed these bounds they were immediately seized, as heretofore, and carried back to the nest, into which they were always very glad to escape from the clutches of their ardent parent. Notwithstanding all her vigilance, one contrived, on the fifth day, to escape her eye, and passing the fatal boundary was immediately devoured by the other fish, which now seemed always on the watch, neglecting its own barren nest, being intent only on appropriating to itself the nestlings of its fruitful neighbour. In this act of cannibalism we see the reason for the parent's anxious care and its jealousy of its kind; and it is evident from Mr. Crookenden's account, previously quoted, that they greedily devour each other's spawn. The young fry, however, have other enemies as well as their own species. One day a favourite *Hydra*, *H. fusca*, was observed to be distended in a most extraordinary manner; on examination, it was found to have swallowed the head and shoulders of one of the young fish many times larger than itself, and the caudal extremity, which was too much for it, and which was projecting out of its mouth, had been seized upon by another *Hydra*. Thus, it would appear that these low organized, but powerful and voracious animals, occasionally regale themselves on the flesh of the *Vertebrata*. This happened when the fry were three or four weeks old.

All the old fish, with the exception of that with the young, were, in consequence of their cannibal propensities, turned out of the trough; and danger being thus removed, the fry were no longer restricted in their rambles, but enjoyed the whole range of their crystal abode. Henceforth the parent's assiduity gradually relaxed, though for days afterwards it was its custom to take the young occasionally into its mouth, and after carrying them a little distance to let them drop out again. I took one of the fry out one day for examination with the microscope; on returning it to the trough, it was in so sickly a state

as to be scarcely able to leave the vessel, which was held in the hand. The old fish, perceiving the helpless condition of its offspring, came up to the surface of the water, and seizing hold of the exhausted young one carried it off almost from amidst my fingers, and taking it to some distance puffed it out of its mouth into a tuft of *Conservæ*. This courageous act of our little fish would seem, in some measure, to give credence to the assertion, so frequently made, that some of the sharks protect their young by receiving them into the mouth on the approach of danger.

Other facts might be related evincing parental attachment; but perhaps enough has been said to satisfy those who take an interest in such matters that in this respect the three-spined stickleback is scarcely, if at all, inferior to the hen, whose affectionate regard for her offspring has ever been the theme of admiration. Incubation, with the fish, is out of the question; it attends its nest, however, as diligently as any of the feathered tribes, keeping it in constant repair, fanning it with its fins, and removing anything that might obstruct the free action of the water upon the eggs; it defends its young with the same undaunted courage, and though it cannot gather them under spreading wings as the hen gathers her brood, yet all those which stray are brought back to the nest, that they may be under the protection of their ever-vigilant and courageous parent.

The nest of the fifteen-spined stickleback (*Gasterosteus spinachia*) was first noticed by Mr. Jonathan Couch, on the Cornish coast, in 1842. Since then it has been observed two or three times on the coast of Northumberland. It is composed of pendant sea-weeds bound together, by a silk-like thread, into pear-shaped or fusiform masses: the spawn is deposited in the centre of the mass. Mr. Couch says, "One of these nests was visited every day for three weeks, and the old fish was found invariably guarding it: it would examine the nest on all sides, and then retire for a short time, but soon return to renew the examination. On several occasions," continues this gentleman, "I laid the eggs bare by removing a portion of the nest, but when this was discovered great exertions were instantly made to recover them. By the mouth of the fish, the edges of the opening were again drawn together, and the other portions torn from their attachments and brought over the orifice till the ova were again hid from view: and as great force was sometimes necessary to effect this, the fish would thrust its snout into the nest, as far as the eyes, and then jerk backwards till the object was effected. While thus engaged, it would suffer itself to be taken in the hand, but repelled any attack made on the nest, and quitted not its post so long as I remained."

Mr. Richard Howse, who found three or four of these nests in a pool among the rocks at Tynemouth, a year or two ago, informs me that each was attended by a fish, and that they scarcely ever left their nests, but kept hovering about, attentively examining them, and thrusting their projecting muzzles amidst the sea-weeds of which they were composed; the fish would occasionally poise themselves close to the nest, and fan them with the pectoral fins in the same manner as the three-spined species. And, indeed, it is quite evident, from the accounts given by these two gentlemen, that the habits of both species, in all that concerns nidification, perfectly coincide; both guard the nest with the same unwearied perseverance, drive off enemies, make all necessary repairs, fan or ventilate the nest, and keep it in all respects in good order.

It is satisfactory to observe this exact similarity of habits, for Mr. Couch has changed his opinion, apparently upon insufficient grounds, respecting the nest, which he attributed to the fifteen-spined stickleback. He now considers it to belong to the common shanny (*Blenius pholis*), arriving at this conclusion after having examined the young hatched from ova taken out of one of the nests. "Being from the first," says this gentleman, "impressed with the conviction that they were the young of the fifteen-spined stickleback, I was much surprised to notice the great difference of their shape from that of their supposed parent, more especially in the parts before the eyes, which, instead of being elongated and slender, were short and round. In consequence of this, they were closely examined with glasses, and drawn with the aid of a microscope of low power; and, though I failed to detect satisfactorily the ventral fins of that fish, (chiefly perhaps from their slender form and transparency), yet, from the declivity of the head, protuberance of the belly, the pectoral fin, and the length of the dorsal and anal fins, which in some specimens were continuous with the caudal, and in others separated by a slight notch, I had no hesitation in referring them to the common shanny."

Now, the young of the three-spined stickleback differ just as widely from the mature fish as the young of the fifteen-spined species are stated to do; and, what is of still more importance, the differences are of exactly the same kind. In the former, as well as in the latter, the parts before the eyes are short and round, and can scarcely be said to project at all in front; the declivity of the head is consequently great; the belly is protuberant, and the dorsal and anal fins are long and continuous with the caudal. The young of the three-spined stickleback would therefore appear also to possess, at first, the characters of

the shanny; but as development goes on the jaws are pushed out, the belly is reduced in comparative size, and the dorsal and anal fins are shortened, and become ultimately separated from the caudal. Thus, in course of time, the young gradually assume the form and characters of the parent. And there can be little doubt that this would have been found to be the case with the young of the fifteen-spined stickleback, had Mr. Couch watched their development a little longer. The obtuse form of the head, on which that gentleman places much stress, is the embryonic condition of all fishes; the elongation of the jaws is always an after-development.

In conclusion, it may be remarked, that of the three or four other species of fish described to nidify, one, a native of Demerara, is stated to remain by the side of the nest with as much solicitude as the hen guards her eggs; the same is said respecting another species inhabiting the Black Sea: but in none, so far as I am aware, has parental attachment been observed to equal that evinced by the three-spined stickleback. Yet we must not, therefore, conclude that it does not exist to the same extent in others of the finny tribes. The habits of these animals are very little known; and who can say what time may bring to light respecting the economy of the inhabitants of the deeper regions of the sea! It is only, as it were, the other day that nothing was known of the nidification of the three-spined stickleback,—a resident of almost every pool, river and rivulet in the kingdom.

P.S.—Since the above paper was read, I find I am wrong in assuming that Mr. J. Couch is the author of the Memoir on the Nidification of the Fifteen-spined Stickleback, which was published in the Transactions of the Royal Institution of Cornwall: this Memoir is, I am informed, from the pen of Mr. R. Q. Couch. Not being able to refer to these Transactions, I quoted from the 'Illustrations of Instinct,' the work of the former gentleman, and in it the author's name of the communication in question is not given. Mr. R. Q. Couch has assured me that he still entertains the opinion he originally expressed, that the nest described by him really belongs to the fifteen-spined stickleback.

I have also recently ascertained that, so far back as 1839, Dr. Johnston described the nest of this fish, in the Transactions of the Berwickshire Naturalists' Club. In the Doctor's communication it is stated that "In an early volume of the 'Edinburgh Philosophical Journal' there is a slight notice of fishes' nests found on the coast of Berwickshire, by Admiral Milne; but the species of fish, by whom

they are constructed, is not mentioned." And it is further stated that "Mr. Duncan, of Eyemouth, has ascertained that they belong to the fifteen-spined stickleback, a fact confirmed by the Rev. Mr. Turnbull, to whom the Club is indebted for specimens." The nest and habits of the fish are then accurately described; and in a concluding note it is announced that Mr. Maclaren, of Coldinghame, had seen and watched the stickleback in the act of making the nests.

It would therefore appear that the credit is due to these gentlemen, not only of publishing the first observations on this interesting subject, but also of determining the fact that these nests belong to the fifteen-spined stickleback.

A few Remarks on the Pulsations of some of the Land Mollusks.

By J. W. WATSON, Esq.

HAVING been engaged a little in the examination of the internal structure of some of the mollusks,—chiefly the Limaces, as being easier to dissect than most,—and having unexpectedly become cognisant of one or two facts respecting them, I thought it might not be out of place to record some of these observations in the 'Zoologist,' for I feel assured, from the papers on various subjects which appear in it from time to time, that its contributors, and, as a matter of course, its readers, do not confine themselves to the mere collection of specimens, but aim at something higher.

It is very pleasing to observe that the study of land and fresh-water shells has become much more general than it was a few years ago, particularly amongst young people; and though they are most of them small and insignificant in appearance, requiring very diligent search in order to discover them, there is something very interesting even in their outward form, of which there is considerable variety, from the spirally twisted *Clausilia* to the disk-like *Zonites*; and, in size too, only compare the huge *Helix Pomatia* with his pigmy brother *H. pygmæa*! When, however, we extend our inquiries to their inhabitants, observing their habits and investigating their physiology, we at once raise the study to a rank on a par with that of Zoology, Entomology, or any other branch of Natural History. That to which I would invite the attention of the readers of the 'Zoologist' is the circulating system of the mollusks. Perhaps in none can it be better observed than in the common slug (*Limax maximus*), from his large size: he is

provided, as is every other land mollusk, with a breathing-hole, into which, at irregular intervals, air is admitted, though it continues for the most part open, when the animal is in motion, closing instantly if the smallest breath of air comes against it. This opening discloses wonders when closely examined; the cavity to which the breathing-hole opens extends right through the upper part of the body, beneath the mantle to the skin on the other side. Within this may be seen part of the pulmonary vessels, the greater portion of the heart, and a sac containing the arteries, through which the semitransparent blood is poured to all parts of the body. The arterial sac is furthest removed from the opening, and shows the pulsations in a remarkably beautiful manner; in fact, the arteries themselves may be seen to be slightly darkened by the flow of the blood at every stroke. The number of pulsations in the one I first examined was from 50 to 55 per minute. In front of a portion of this sac is the heart, which is a whitish and almost opaque body, the lungs being spread over the upper part of the cavity, and protected by the flat internal shell. Having been very much interested with the above observations, I was led to make further investigations and experiments on the circulating system of a few of the other commoner mollusks, and the following is the result of some of these investigations.

At a temperature of about 60° or 65° Fahr. the pulsations of *Zonites radiatulus* are from 50 to 55 per minute; of *Z. crystallinus* 60 to 65; of *Z. parvus* about 70; of *Z. nitidulus* 65 to 70; and of *Z. alliarius* 65 to 70. The pulsations of *Helix hybrida*, in an immature specimen, were about 90 per minute; the latter, however, was examined when the temperature was about 70° Fahr. This may seem to some to be a useless remark, and may perhaps excite a smile, but let them read on, and I doubt not they will be as much surprised as I was at finding what an effect a small amount of heat has upon the circulation of these seemingly sluggish creatures. Let any one, after watching and counting the pulsations of *Z. alliarius* at the above temperature, take the same shell into his *hand*, and he will find that the pulsations are very much accelerated almost instantly; in fact, nearly doubled. The pulse of *Z. alliarius* beats at the rate of 110 per minute. In *Z. radiatulus* I counted 100 per minute, and similar results were obtained from the rest. From this I was induced to proceed still further, and see what effect the abstraction of heat had upon them: I found it precisely the same as might have been expected from the above results.

By dissolving equal parts of saltpetre and muriate of ammonia in

six parts of water, a cooling mixture is made: over this I placed a piece of metallic foil touching the fluid, and upon this laid *Z. alliarius*: in a very few seconds the pulse began to decrease, until there were only about 80 beats per minute, and these very weak.

It does not require any very close investigation to make these observations, since the beating of the pulse of *Z. alliarius* is quite evident to the naked eye at the under side of the shell, on account of its transparency, and with a small pocket lens it is very distinct.

Where, in Nature, can we find more marvellous results than these? for by merely increasing the temperature a few degrees, we have the pulse increased to a feverish speed, and by reducing the heat in the same degree there is almost a cessation of its action. The problem of how mollusks exist during their hybernation is solved at once, and in a most satisfactory manner.

J. W. WATSON.

Flounders Institute, Ackworth, near Pontefract,
June 26, 1854.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

July 3, 1854.—EDWARD NEWMAN, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—The 'Zoologist' for July; by the Editor. The 'Athenæum' for June; by the Editor. The 'Literary Gazette' for June; by the Editor. The 'Journal of the Society of Arts' for June; by the Society. 'The Natural History Review,' No. 2; by the Editor. 'Monographia Cassididarum,' auctore C. H. Boheman, Holmiæ, 1854; by the Author. 'Hewitson's Exotic Butterflies,' Part 11; by W. W. Saunders, Esq. 'Bibliotheca Historico-Naturalis,' 3 Jahrgang, 1 Heft, 1853; by the Author, Ernst A. Zuchold. Fifty specimens of British Lepidoptera; by T. H. Allis, Esq.

Exhibitions.

Mr. Stevens exhibited a living full-grown larva of *Notodonta Carmelita*, reared from the egg; a specimen of *Pyrochroa pectinicornis*, a new British beetle, taken by Mr. Buxton, in Scotland; and *Damaster Blaptoides*, *Koll.*, from Japan, of which only four specimens were known in Europe.

Mr. Waring exhibited several insects, found dead and covered with a tough film, apparently of a fungoid nature.

Mr. Janson exhibited a box of *Lepidoptera* and *Coleoptera*, captured by Mr. Foxcroft, in Scotland; also *Drilus flavescens* and other insects, taken on the occasion of the Society's excursion to Darenth Wood, on the 17th of June, when the Members present had the pleasure of the company of Herr C. A. Dohrn, President of the Entomological Society of Stettin, and Professor C. H. Boheman, Conservator of the Entomological Museum at Stockholm. He also exhibited six specimens of the scarce *Hypulus quercinus*, taken on the 8th and 10th of June, at Colney Hatch Wood.

Mr. Stainton exhibited specimens of the new British *Anthrocera* *Minos*, taken near Galway, by A. G. More, Esq., by whom they were sent for distribution among the Members.

Mr. Douglas exhibited a new species of *Lithocolletis*, bred from leaves of *Vaccinium Vitis-Idæa* sent from Scotland by Mr. Weaver; also *Parasia Metzneriella*, the larva of which fed in the receptacle of a flower-head of *Centaurea nigra*.

Mr. Smith exhibited *Nemada armata*, Smith, a bee hitherto exceedingly rare, but which Mr. Dossetor found to be common at Cline Wood, near Swansea, in company with *Andrena Hattorfiana*. He also exhibited a male of *Tenthredo cingulata*, this sex being rare, although the female is common in many places; and a new British *Crabro*,—both taken by Mr. Dossetor, at the above locality.

Carabus intricatus.

Mr. Waterhouse stated that a clergyman, the Rev. Mr. Hore, had lately informed him that he had, at different times, taken in the neighbourhood of Plymouth four specimens of *Carabus intricatus*,—a species which had been looked upon as a doubtful native.

Nepticula quadrimaculella.

Mr. Stainton called attention to a paper, by Professor Boheman, on Entomological discoveries made during a tour in the South of Sweden, in 1851, published in the Transactions of the Stockholm Academy, containing descriptions of many new species of all Orders, and, among them, a description of the insect taken by Mr. Boyd in the New Forest, and exhibited at the August meeting of this Society last year, which Mr. Stainton thought was *Trichopterous*, but which Prof. Boheman had, without any remark, placed among the *Lepidoptera*, under the name of *Nepticula 4-maculella*.

Nature of the Materials of Wasps' Nests.

Mr. Ingpen said that a microscopic examination of the material of wasps' nests rendered it doubtful if it were made of woody fibre, as was generally believed, for, viewed under a high power, it appeared to be composed of fungoid matter.

Mr. Mark, of Bogota, present as a visitor, said that in South America the wasps collected wood for their nests.

The President stated that Professor Quakett had made a microscopical examination of an anomalous mass taken by Mr. Bree from a rail cut out of the solid wood of an oak, and had pronounced it to be not wood, but fungus.

Genus Amycturus, &c.

Mr. Waterhouse read a paper entitled "Notes on the Genus *Amycturus* and allied Genera of *Coleoptera*, with Descriptions of some new Species."

New Species of Pausus.

Mr. Westwood read descriptions of four new Paussi, viz. *P. pacificus* from Ceylon, *P. De Geerii*, *P. Afzelii*, and *P. Bohemania*, all from Caffraria; the first communicated for description by Herr Dohrn, the others by Professor Boheman. He also read "Notes on various Insects," by Mr. W. Varney.

New Part of the 'Transactions.'

Part I, Vol. iii., new series of the 'Transactions,' was on the table.—*J. W. D.*

A List of the Mollusca hitherto found in the Province of Moray and in the Moray Firth. By the Rev. GEORGE GORDON.

(Continued from page 4318).

Gasteropoda Prosobranchiata.

Tufted Canoe-shell, *Chiton fascicularis*. Rather rare. Burghead, Mr. Murray.

Hanley's Canoe-shell, *Chiton Hanleyi*. A specimen taken from a fish killed in the Moray Firth was identified by A. Hancock, Esq., as belonging to this species.

Red Canoe-shell, *Chiton ruber*. Occasionally found in the Firth. A specimen from Mr. Duff's cabinet is now placed in the Elgin Museum.

Ash-coloured Canoe-shell, *Chiton cinereus*, (*C. marginatus*, Flem. and Mac., and also *C. fuscatus*, Mac.) Very abundant.

White Canoe-shell, *Chiton albus*. Not common. Has been discovered at Burghead by Mr. Murray.

Slater-like Canoe-shell, *Chiton asellus* (*C. cinereus*, Flem. and Mac.) Common; but in deeper water, or farther below high-water mark than *C. cinereus*.

Marbled Canoe-shell, *Chiton marmoreus*. A few specimens of this pretty Chiton have been found in fish killed in the Moray Firth: it has also been met with by Mr. Murray at Burghead.

Common Limpet, *Patella vulgata*. Wherever there is rock or boulder within tide-mark this limpet abounds. Its numbers, however, on the Elginshire coast, in the vicinity of the fishing villages of Burghead, Hopeman and Lossiemouth, are comparatively few, as it is much used as bait, on account of the prevailing scarcity of the common mussel.

Transparent or Smooth Limpet, *Patella pellucida*, (also *P. levis*, Flem. and Mac.) Common, in both varieties.

Tortoise-shell Limpet, *Acmæa testitudoinalis*. This, when cleaned, is a very pretty little limpet, and well deserves its specific title. It has hitherto been reckoned among the scarcer British shells. Its recent discovery in several localities, together with its abundance in the Moray Firth, from Stotfield to Burghead, has inclined some to think that there has lately been some extraordinary increase or a southerly migration of the species, while others suppose that it has been overlooked as the young of the common limpet.

Virgin Limpet, *Acmæa virginea*, (*Patella virginea*, Flem.; *Lottia virginea*, Mac.) Not uncommon in the Firth. Mr. Murray has presented some fine specimens, collected at Burghead, to the Elgin Museum. Frequent in shell-sand, Portsoy.

Tawny Limpet, *Pilidium fulvum*. "In thirty fathoms, twenty miles north of Kennard's Head, Aberdeenshire (Thomas)," *F. & M.* One specimen in Edward's collection, March, 1854.

Common Tooth-shell, *Dentalium entalis*. Common.

Hungarian Fool's-cap, *Pileopsis Hungaricus* (*Capulus Hungaricus*, Flem. and Mac.; also *C. militaris*, Mac.) Two specimens have been found by Mr. Murray on the fishermen's lines at Burghead, and two more have since been discovered by Mr. Macdonald among shells sent to him from Buckie. Occasionally in shell-sand. Also in Edward's collection.

Net-worked Fissurella, *Fissurella reticulata* (*F. Græca* and *apertura*, Flem.) Three specimens were obtained from shell-sand collected on the South-eastern coasts of Caithness, and obligingly forwarded by the Rev. Mr. Whyte, of Canisby.

Noah's Chink-Limpet, *Puncturella Noachina*, (*Rimula Flemingii*, Mac.) "In sixty fathoms, Troup Head, (Thomas)," *F. & H.*

Common Slit-Limpet, *Emarginula reticulata*, (*E. fissura*, Flem. and Mac.; also *E. curvirostra*, Mac.) Has been frequently met with at the different fishing villages of the Moray Firth.

Jujube Pyramid-Shell, *Trochus zizyphinus* (also *Z. conuloides*, Mac.) Common. The authors of the 'History of British Mollusca, p. 491, vol. ii., notice the late Dr. Macgillivray's specific name "*Sisyphinus*," and his derivation of this term ('Mollusca of Aberdeenshire,' p. 53) from some fancied analogy to the rolling-stone of Sisyphus; but they do not seem to have observed his correction of this spelling and derivation given in an after part of his volume (p. 349), where he says,

among other emendations, "*Zizyphinus*. Incorrectly *Sisyphinus*. *Zizyphum*, jujube, a kind of fruit."

Alabaster Pyramid-Shell, *Trochus alabastrum*. Rare. "Lieut. Thomas has dredged it on a stony bottom in sixty fathoms, off Troup Head, Aberdeenshire," *F. & H.* Mr. Macdonald has also (August, 1852) dredged this species in forty fathoms, off Lossiemouth.

Martin's Pyramid-Shell, *Trochus millegranus* (*T. Martini*, Mac.) Occasional. "In thirty to thirty-five fathoms, Moray Firth (McAndrew and E. F.)," *F. & H.* "This pretty *Trochus*" has been sparingly found at Lossiemouth, and an example of it has been met with by Mr. Murray at Burchhead.

Tumid Pyramid-Shell, *Trochus tumidus*. Common.

Gray purple-streaked Pyramid-Shell, *Trochus cinerarius*. Very common. All the species of this genus, particularly the present, are provincially known as "sillar- or silver-buckies."

Waved *Trochus*, *Trochus undulatus*. From among shell-sand collected on the South-eastern coasts of Caithness, by the Rev. Mr. Whyte, of Canisby.

Pearly Pyramid-Shell, *Trochus Helicinus*, (*Turbo margarita*, Flem., *Phorcus margarita*, Mac.) Frequent near low-water mark and in shell-sand. To this list of Moray-Firth Trochi one addition at least may be expected to be made by future observers, viz., T. Montagui, found "in thirty fathoms at Buchanness, and from seven to forty fathoms in Orkney," *F. & H.*

Messrs. Forbes and Hanley (p. 525, vol. ii.) quote Dr. Macgillivray's *Monodonta crassa*, two specimens of which were found near Peterhead (Aberd. Moll. p. 325), as a synonym of their *Trochus lineatus*, to which species they however assign a "South-western and Western range," and thus, as it were, exclude the Aberdeenshire locality. They also state that *Trochus umbilicatus* "is absent from the entire Eastern side of Britain" (p. 522); yet the *Trochus umbilicatus* of the Aberdeenshire Mollusca is quoted as the same species, which, by Dr. Macgillivray (p. 325), is said to be "common about Slains, Peterhead and Banff." These two statements are evidently at variance; but the error probably originated with Professor Macgillivray. It is not at all likely that the true *T. lineatus* has been found so far North.

Painted or Oval-banded Phasianella, *Phasianella pullus*, (*Cingula pullus*, Flem.; *Rissoa pullus*, Mac.) A few fragments of this beautiful little shell were found in shell-sand collected on the S.E. shores of Caithness. They were probably, however, brought there, from a more westerly locality, by the tidal currents through the Pentland Firth.

In districts where attention is paid to the indigenous Mollusca, a few shells, more than doubtful intruders, or having no good claim to denizenship, generally come under the eye, and are most properly noticed by the naturalist. *Neritina fluviatilis* and *Paludina vivipara* are often met with in such circumstances, being carried in ballast or otherwise beyond their native localities. Thus the former has been got from Findhorn by Mr. Murray, and Mr. Martin found a shell of *Paludina vivipara* in the estuary of the Lossie. The latter has also been recently picked up in a mutilated state among sea-shells on the N.E. of Findhorn.

Nerita-like Periwinkle, *Littorina neritoides*. Burghead, Mr. Murray. Abundant on the rocks about high-water mark between Burghead and Cummingston, August, 1853; Stotfield, Covesea, &c., Mr. Macdonald.

Common Periwinkle or "Buckie," *Littorina littorea*, (*Turbo littorea*, Flem.) Abundant. This is the only univalve that is ever, and that but rarely, collected and exposed for sale in the market-towns bordering on the Moray Firth.

Coarse Periwinkle, *Littorina rudis*, (*Turbo rudis*, Flem.) Very abundant, and in many of its varieties.

Flat-topped Periwinkle, *Littorina littoralis*, (*Nerita littoralis*, Flem.; *Littorina neritoides*, Mac.) Everywhere abundant along the coast.

Pallid Lacuna, *Lacuna pallidula*, (*Natica pallidula*, Flem.) Frequent.

Banded pink-tipped Lacuna, *Lacuna puteolus*, (*Turbo fasciatus* and *Natica lacuna*, Flem.; *L. fasciata* and *sulcata*, Mac.) Found among shell-sand from the South-eastern shores of Caithness.

Variable Lacuna, *Lacuna vineta*, (*Turbo quadrifasciata*, Flem.) Common; often in shell-sand.

Thickened Lacuna, *Lacuna crassior*, (*Turbo crassior*, Flem.) A specimen dredged by Mr. Macdonald in the Firth. It has also been found in shell-sand.

The Shetland Rissoa, *Rissoa Zetlandica*, (*Cyclostoma Zetlandica*, Flem.) Found in shell-sand from S.E. of Caithness.

Bean's Rissoa, *Rissoa Beanii*. Also found, with the preceding, in the Caithness shell-sand, but it seems to be more rare.

Punctured Rissoa, *Rissoa punctura*, (*Cingula reticulata*, Flem.; *R. puncturata*, Mac.) Occasionally found among shell-sand. Frequent among that from Caithness. Mr. Murray has found it alive among the roots of *Laminaria digitata* at Burghead.

Striated Rissoa, *Rissoa striata*, (*Cingula semicostata* and *striata*, Flem.; *Odostomia semicostata* and *Marionæ*, also *R. gracilis*, Mac.) Frequent in shell-sand from all parts of the Firth, and plentiful, alive, between tide-marks at Burghead, Lossiemouth, &c.

Small or Spot-banded Rissoa, *Rissoa parva*, (*Cingula parva* and *alba*, Flem.; *R. alba*, Mac.) Common. "Frazerburgh and Gamrie," Mac.

Semistriated Rissoa, *Rissoa semistriata*, (*Cingula semistriata*, Flem.; *R. tristriata*, Mac.) Frequent.

Red Rissoa, *Rissoa rubra*, (*Cingula rubra* and *unifasciata*, Flem.) Common. The variety *unifasciata* is also met with frequently.

Reddish brown-banded Rissoa, *Rissoa cingillus* (*Cingula cingilla*, Flem.; *R. cingillata*, Mac.) Found in shell-sand from the South-eastern coasts of Caithness.

Slake Rissoa, *Rissoa Ulvæ*, (*Cingula Ulvæ*, Flem.) "Abundant in the estuary of the Findhorn," Mr. John Shand.

From their known range it is most probable that the following species will also be found in the Moray Firth, viz., *Rissoa costata*, "Northumberland and Orkneys," and *Rissoa inconspicua*, "Scarborough and Lerwick."

Although hitherto not met with in the Moray Firth, yet *Jeffreysia diaphana* has been found on each side of it, viz., at "Lerwick" and "Northumberland," F. & H.

Brown Skenea, *Skenea planorbis*, (*S. depressa*, Flem. and Mac.) Frequent in shell-sand.

Ammonite Skenea, *Skenea rota*. Among some shells which Joshua Alder, Esq., Newcastle, most kindly took the trouble of naming, was a specimen of this rare Skenea, which was picked out of shell-sand gathered on the South shore of the Moray Firth.

Semistriated Skenea, *Skenea divisa*. "Frazerburgh," Macgillivray.

Augur Turritella, *Turritella communis*, (*T. terebra*, Flem. and Mac.) Common all along the coast, and often taken up by the fisherman's line.

Pelican's-foot Aporrhais, *Aporrhais pes-pelecani*, (*Rostellaria pes-pelecani*, Flem. and Mac.) This common shell is popularly known as the "key of the sea."

Sinistral Cerithium, *Cerithium adversum*, (*Terebra perversa*). A well-marked portion of a shell was picked out of shell-sand collected on the South-eastern coasts of Caithness.

Trevelyan's *Scalaria*, *Scalaria Trevelyana*. Mr. Macdonald has dredged a single specimen of this northern, yet pretty shell, off

Lossiemouth; and Mr. Murray has found another on the fishermen's lines at Burghead. The only British locality yet known for *Scalaria Grœnlandica*, "off Duncansbay Head," where Mr. McAndrew dredged fragments of it, if not within, is close on the borders of the district assigned to this list.

Glossy Aclis, *Aclis nitidissima*, (*Turritella nitidissima*, Flem.) Found in shell-sand, both from Burghead and Lossiemouth. Another species may be looked for as an addition to this list, viz., *A. Ascaris*. It has been found by Mr. Alder on the East coast, and by Mr. McAndrew in Zetland.

Polished Eulima, *Eulima polita*, (*Phasianella polita*, Flem.) A small specimen, discovered by Mr. Macdonald, is now in the Elgin Museum; and a larger one was observed in Edward's collection, from Banff.

Two-lined Eulima, *Eulima bilineata*, (*Phasianella subulata*, Flem., *E. subulata*, Mac.) A small specimen was dredged by Mr. Macdonald in the Moray Firth, and two more have been found in shell-sand from Caithness. The following species of Eulima have a range, in the North and East coasts, including the Moray Firth, viz., *E. distorta*, "Orkney, Aberdeen and Northumberland," and *E. subulata*, "Zetland and Scarborough."

Orange-filleted Chemnitzia, *Chemnitzia fulvocincta*, (*Turritella similima*, Flem.) Mr. Macdonald has dredged one specimen of this beautiful shell, alive, in the Moray Firth. A few other specimens, chiefly broken, have been found in shell-sand.

Indistinct Chemnitzia, *Chemnitzia indistincta*, (*Turritella truncata*, Flem.) Dredged alive, off Lossiemouth, by Mr. Macdonald. Not unfrequent among shell-sand.

Unidentate or Single-toothed Odostomia, *Odostomia unidentata*, (*O. plicata*, Flem.) This is by far the most common species of this genus within this district. It is frequent among the shell-sand of Caithness. Mr. Macdonald has found it alive on a dead bivalve, dredged in the Firth, in 1853.

Rissoa-like Odostomia, *Odostomia Rissoides*, (*O. scalaris*, Mac.) A few specimens have been picked out of shell-sand from Caithness. Mr. Macdonald has found it alive between tide-marks, at Burghead.

Cylindrical Odostomia, *Odostomia cylindrica*, (*Turbo nivosus*, Flem.) Two specimens of this rare shell have been found among a quantity of shell-sand from the S.E. coast of Caithness.

Oblong or divided Odostomia, *Odostomia interstincta*, (also *O. oblonga*, Mac.) Rare. A few specimens from Caithness shell-sand.

Spirally-ribbed *Odostomia*, *Odostomia spiralis*, (also *O. plicatula*, Mac.) Found in shell-sand, gathered at Portsoy, by Miss Pirie. It also occurs among the shell-sand from Caithness. Among a set of specimens forwarded to Albany Hancock, Esq., he identified and most kindly named the above species of this most difficult genus.

Cross-lined or Decussated *Odostomia*, *Odostomia decussata*, (*Turbo decussata*, Flem.) A few specimens were picked out of the shell-sand, gathered at Portsoy, by Miss Pirie. The following species of *Odostomia* have been found both to the North and to the South of the Moray Firth, viz. *O. plicata*, "Lerwick" and "Aberdeenshire;" *O. insculpta*, "Lerwick and Aberdeen."

McAndrew's *Eulimella*, *Eulimella Scillæ*. "In thirty-four fathoms, Elgin," F. & H.

Needle *Eulimella*, *Eulimella acicula*. Two specimens, most probably of this species, were dredged off Lossiemouth by Mr. Macdonald.

Beaded *Natica*, *Natica monolifera*, (*N. glaucina*, Flem.) Not rare.

Alder's *Natica*, *Natica nitida*, (*N. Alderi*, Flem. and Mac.) Frequent. A beautiful series of this pretty species has been collected at Burghead by Mr. Murray.

Sordid *Natica*, *Natica sordida*. Mr. Macdonald has dredged one specimen off Lossiemouth; Mr. Duff procured another from a Lossiemouth fisherman. Both are now in the Elgin Museum.

Montagu's *Natica*, *Natica Montaguï*, (*N. rufa*, Flem. and *N. rutila*, Mac.) Not rare, although far from being so frequent as *N. nitida*.

Helicine *Natica*, *Natica Helicoides*. One from a fish-stomach, 1850. Mr. Martin, in 1853, met with another in a fishing-boat at Lossiemouth.

Striated *Velutina*, *Velutina lævigata*, (*V. striata*, Mac.) Frequent. Sometimes cast ashore in considerable abundance, as on the sands east of Lossiemouth, March, 1853.

Flexible *Velutina*, *Velutina flexilis*, (*Bulla flexilis*, Flem., *Coriocella flexilis*, Mac.) Very rare. A specimen, found by Mr. Martin near Lossiemouth, is now in the Elgin Museum.

Haliotis or Ear-shaped *Lamellaria*, *Lamellaria perspicua*, (*Sigaretus Haliotideus*, Flem.) The only locality, as yet observed, for this mollusk in the Moray Firth is Burghead; the supposed Ptoroton of Ptolemy, the Eccialshacca of Torphæus. Mr. Murray, who discovered it, states that it is by no means rare.

Northern Trichotropis, *Trichotropis borealis*, (*Fusus Laskeyi* and *Trichotropis umbilicatus*, Mac.) Has been found in two instances on the southern shore of the Firth; at Burghead by Mr. Murray; and at Buckie by Mr. Macdonald.

Hedgehog Rockshell, *Murex erinaceus*, (*Triton erinaceus*, Flem.) Only one, and that a mutilated specimen, has been found by Mr. Martin at Lossiemouth, probably brought thither by tidal currents, or in ballast, from some distant locality.

White Whelk or "Horse Buckie," *Purpura lapillus*. Most abundant around the whole coast; particularly, and in many of "the guises it presents," at the "back shore" of Burghead.

Net-worked Nassa, *Nassa reticulata*. Only two specimens of this, elsewhere a rather common shell, have been as yet collected in the Moray Firth; one by Mr. Duff, now in the Elgin Museum, and the other by Mr. Martin. To the denizenship of this species the same doubt must be attached as noticed in reference to *Murex erinaceus*.

Black-spot Nassa, *Nassa incrassata*. Abundant among shell-sand; and often to be met alive adhering to sea-weed, &c. Mr. Macdonald has found it in the stomach of *Solaster papposa*.

Waved Buccine, *Buccinum undatum*, (also *B. carinatum*, Flem. and *B. Anglicanum*, Flem. and Mac.) Abundantly cast up on the beach; and frequently taken up by the fishing lines, whether inhabited by its original occupant or by the hermit crab. Mr. Murray mentions that in both these states it is found among the rocks at Burghead. This and the larger species of *Fusus* get the provincial name of "roaring buckies."

Islandic Spindle-Shell, *Fusus Islandicus*, (*F. corneus*, Flem. and Mac.) Frequent.

Symmetrical Spindle-Shell, *Fusus propinquus*. A few very young specimens were taken from fish killed in the Moray Firth; but a full-sized and complete one, though long looked for along the coast, was not met with until the 26th of October, 1853, when it was by the merest chance seen among a parcel of shells scattered about as nursery playthings, but which had been gathered by children and brought by them from their sea-bathing quarters at Lossiemouth the previous August. It is now in the Elgin Museum.

Common White Spindle-Shell, *Fusus antiquus*. Very common.

Banff Trophon, *Trophon clathratus*, (*Fusus Banffus*, Flem., *Plesiotoma Banffium*, Mac.) Three specimens have been obtained by Mr. Murray, at Burghead; it has also, but rarely, been seen among shell-sand.

Turretted Mangelia, *Mangelia turricula*, (*Fusus turricula*, Flem., *Pleurotoma turricula*, Mac.) Met with by Mr. Macdonald while dredging off Lossiemouth.

Trevelyan's Mangelia, *Mangelia Trevelliana*, (*Pleurotoma sinuosa*, Flem.; *Pleurotoma reticulatum*, Mac.) Two specimens have been obtained by Mr. Murray at Burghead.

Lineated Mangelia, *Mangelia linearis*, (*Pleurotoma linearis*, Flem., *Fusus Buchanensis*, Macq.) This species occurs in the Moray Firth more frequently than any other of the genus. It seems to be the resort of small hermit crabs, and then is picked up by the haddock.

Brown or Clouded Mangelia, *Mangelia nebula*, (*Fusus nebula*, Flem.) One specimen has been found by Mr. Murray at Burghead, and two or three got in the stomachs of fish.

Short-mouthed Mangelia, *Mangelia brachystoma*. A few specimens have been obtained from fish killed in the Moray Firth.

Strong-ribbed Mangelia, *Mangelia costata*, (*Fusus costatus*, Flem.) A single specimen, dredged in the Firth by Mr. Macdonald, is now in the Elgin Museum.

European Cowrie, *Cypræa Europea*. Well known to, and eagerly searched for on the shingly sea-shore, by young conchologists, under the provincial name of "John o' Groat's buckies." Most abundant, 1826, on the shores of the Pentland Firth, near the reputed site where that famous Knight of the Round Table built his house.

Smooth Marginella, *Marginella lævis*, (*M. voluta* and *Voluta fusiformis*, Flem.) Here, as in many other instances, Mr. Murray has the merit of adding a beautiful species to the list of Moray shells. He found this pretty little gem in a boat, among the débris cast off from the lines of a Burghead fisherman who had just returned from the fishing-ground. But one specimen, generously presented to the Elgin Museum, has as yet (November, 1859) been met with in the Firth.

Gasteropoda Opisthobranchiata.

Cylindric Cylichna, *Cylichna cylindracea*, (*Bulla cylindracea*, Flem., *Bullina cylindracea*, Mac.) Occasionally met with in shell-sand; more frequently in the stomach of the haddock; and sometimes to be picked off from the fishing-lines at the different stations on the Firth.

Truncated Cylichna, *Cylichna truncata*, (*Bullina truncata*, Flem.,

Bullina truncata and *B. pellucida*, Macq.) Frequent in shell-sand. Common, alive, between tide-marks at Burghead, Mr. Macdonald.

Oblong Cylichna, *Cylichna umbilicata*, (*Bulla umbilicata*, Flem.; *Bullina umbilicata*, Mac.) In shell-sand, but more rarely than the preceding species.

Transparent Amphisphyra, *Amphisphyra hyalina*, (*Bulla minuta*, Mac.) First discovered in the Moray Firth by Mr. Murray at Burghead, where it occurs occasionally in shell-sand.

Banded Tornatella, *Tornatella fasciata*, (*T. tornalis*, Flem., and *T. tornalis*, *T. pellucida* and *T. pusilla*, Mac.) Occasionally to be picked up on the shore. It is preyed on by the haddock.

Bulla-like Akera, *Akera bullata*, (*Bulla Akera*, Flem.) "The Rev. Charles Cordiner, of Banff, observed this shell in the Moray Firth, and transmitted specimens to the Duchess of Portland," Fleming, *British Animals*, p. 292.

Cranch's Bulla, *Bulla Cranchii*. Frequently to be seen in the stomach of the haddock. Mr. Murray finds it at Burghead.

Wood-tinted Scaphander, *Scaphander lignarius*, (*Bulla lignarius*, Flem.) Not unfrequently found as part of the food of the haddock; the specimens seem smaller than those found on the West coast of Scotland.

Rough Philine, *Philine scabra*, (*Bullæ catenulifera*, Mac.) Occasionally found in shell-sand, but more frequently as part of the food of the haddock.

Punctated Philine, *Philine punctata*, (*Bullæ punctata*, Mac.) One specimen, alive, has just been found (July, 1854) by Mr. Murray at Burghead, near low-water mark. "Off Trouphead, Aberdeenshire, in sixty fathoms (Thomas)," F. & H. These two facts show the great range as to the depth in which this rare species may be found. Both *Philine quadrata* and *P. pruinosa* have been met with on the North of the Moray Firth, at "Zetland," and also on the South—the former on the "Northumberland coast," and the latter in the "Firth of Forth."

The Sea-Hare, *Aplysia hybrida*, (*A. dipilans* and *A. punctata*, Flem.) Frequently to be met with. On one occasion Mr. Martin observed immense numbers drifted on the shore, along with sea-weed, to the west of Burghead. "Very abundant on the rocks at Burghead, in July, 1852," Mr. Macdonald.

In the Appendix II. to the 'History of British Mollusca,' p. 290, it is stated that *Diphyllidia lineata* has been found "off the Shetland Islands," and "from the boats at Whitburn, in the county of Durham."

The following list of a beautiful tribe of Mollusks (*Gastropoda Nudibranchiata*), with remarks upon the different species, has been kindly supplied by Mr. George Murray, whose name has already often occurred in this paper.

Doris tuberculata, (*D. argo*, Flem.) Frequent at Burghead, between tide-marks, where the practised eye will seldom fail to detach it either in rock-crevices or beneath large stones.

Doris Johnstoni. At Burghead, in the same situation as the preceding; not common.

Doris aspera. Common among the rocks at Burghead, where it is found most abundantly during the greatest spring-tides. When these occur their recess lays bare a portion of the rocky beach thickly strewn with stones of all sizes, which are covered with sea-weeds and zoophytes, and are protected from the violent action of the surf by an outer ledge of rock accessible only at such periods, though its top rises considerably above the water during ordinary tides. The space thus imperfectly described constitutes a sort of intermediate territory between the littoral and laminarian zones. In this highly favourable locality, so abundant are the animals of the Nudibranchiate order that a single tide has often sufficed to put the collector in possession of hundreds of individuals, some of which are seldom found except in deep water. Here *D. aspera* especially abounds.

Doris bilamellata. Common between tide-marks at Burghead. This species appears to be somewhat gregarious in its habits, occurring generally in clusters. Not unfrequently a dozen or more have been found on the same stone.

Doris pusilla. The authors of the Monograph on the Nudibranchiate Mollusks, published by the Ray Society,—a work that can never be referred to without the highest admiration,—state regarding this species that the two individuals forming the subject of their description were found “under stones at low-water mark, Torquay.” In a similar situation two were discovered at Burghead, in May, 1853, and another in the following September. Ranging therefore from Devonshire in England to the “Devonshire of Scotland,” as Moray land has sometimes been styled, its distribution is pretty extensive. It does not indeed appear to have yet been met with in any intermediate locality, a circumstance perhaps less owing to its rarity than to its minute size and consequent difficulty of detection, together with the paucity of observers interested in its class. When the latter obstacle is removed—and it is cheering to note among

other "signs of the times" that its days are already numbered—this, and other species at present accounted local, will probably be stripped of that character, and invested with one of greater dignity and importance.

Doris depressa. This species, it is stated in the Monograph, is "generally found adhering to a species of *Lepralia*, incrusting the under surface of stones in pools near low-water mark, and so nearly resembles the zoophyte in colour as not to be detected without the closest inspection, in support of which statement the discovery at Burghead of one individual in 1853, and another in September following, both in the precise situation above described, is now gladly adduced. It may further be remarked of this and the preceding species, though the remark is by no means confined to them, that the most thorough accordance was found to exist between the character of the Burghead individuals and that of the species as described and figured in the Monograph, attesting alike the accuracy of that work, and the permanent character of these species under the modified circumstances necessarily attending so wide a difference of locality.

Doris pilosa, (*D. nigricans*, Flem.) Not rare among the rocks at Burghead. It has been met with above half-tide level, but more frequently in the border land between the littoral and laminarian zones already described. In evidence of its "Protean character" (Mon. Nudib. Moll.), it has been found here in all its known varieties,—white, black, light yellow, and tawny.

Goniodoris nodosa, (*D. nodosa*, Flem.) Common at Burghead between tide-marks. The variations mentioned in the Monograph as having been made by some naturalists the ground of specific distinctions have been observed here, but, considerable though they certainly are, they do not seem to merit the importance thus attached to them.

Triopa claviger. Of this fine species only three individuals have been found at Burghead; one in June, 1853, and two in the following September. It must therefore be considered rare, at least between tide-marks, where the above specimens were found at extreme low-water.

Ægiria punctilucens. Not uncommon at Burghead among the rocks, and most frequent in the vicinity of low-water mark. It has generally been found in small hollows, on the under surface of stones. Somewhat difficult to detect on account of its prevailing tint, and to the naked eye peculiarly uninviting, at least in the rather stunted

form which, with one exception, has characterized the specimens found in this locality: there is no animal of its tribe that will more amply reward the search of the curious, by the unexpected and marvellous beauty of the gem-like spots on its body, when these are brought to view under a Codington lens.

Polycera quadrilineata, (*P. flava*, Flem.) At Burghead; rather rare. Of the few specimens of this attractive creature found here one proved to be the very beautiful black and orange-scarlet banded variety. It was a full-sized specimen, and was found among sea-weeds in a rock pool towards high-water mark. The branchial lobes, even when the animal was newly captured and apparently in vigorous health, were found blunt at the point and inflated, so that other causes besides "a sickly state" (Mon. Nudib. Moll.) would seem to have the effect of inducing this circumstance.

Polycera ocellata. One individual found at Burghead, between tide-marks, in July, 1853.

Polycera Lessonii. A single individual recognized by Mr. Hancock as belonging to this species, was met with in March last, at half-tide level, among the rocks at Burghead.

Ancula cristata. Apparently rare at Burghead, a few individuals only having been found between tide-marks.

Tritonia Hombergii. Two specimens were taken by the Rev. G. Gordon from the stomach of a cod caught in the Frith, some years ago.

Tritonia plebeia. A single specimen was found at Burghead, under a large stone, at low water of a spring tide.

Dendronotus arborescens (*Tritonia arborescens*, Flem. and Mac.) Rather rare at Burghead, where it has occasionally been found in its fully developed state between tide-marks. When this beautiful animal is seen gracefully reposing among the branches of a sea-weed or coralline, no great stretch of fancy is required to imagine it a stately fallow-deer with more than royal antlers couching amid a thicket of ferns. A miniature Dr. Syntax, paying a visit to the laminarian zone and encountering such a tableau in his travels, would certainly be arrested by it as a charming example of the picturesque.

Doto coronata (*Tritonia pinnatifida*, Flem.) Burghead; common among corallines on stones at low-water mark. In all its varieties this little animal is exquisitely beautiful.

Eolis papillosa, (*E. papillosa* and *Lesliana*, Mac.) Not uncommon under stones between tide-marks at Burghead.

Eolis coronata. Very common at Burghead between tide-marks.

On account of its remarkable voracity and addiction to slaughter, this species may be termed the tiger of its tribe,—an appellation, however, which will scarcely suggest its surpassing beauty.

Eolis rufibranchialis. Rocks at Burghead, about low-water mark of spring tides; not rare.

Eolis alba. Two specimens have been found at Burghead by Mr. Macdonald; one in July, 1853, and the other in the same month of the present year; the former near high-water mark, and the latter about low-water mark.

Eolis Landsburgii. An individual of this rare species was found in June, 1853, on a stone between tide-marks at Burghead. Mr. Hancock, to whom the animal was sent, thus writes regarding it:—"This is undoubtedly *E. Landsburgii*, and, though not quite full grown, is much better developed than the individual from which the figures in the Monograph were made." These figures are, however, very accurate and characteristic of the species.

Eolis smaragdina. At Burghead between tide-marks; rare.

Eolis angulata. In 18— Mr. Macdonald found an individual of this species on a shell sent from Buckie, where it had doubtless been brought up from deep water.

Eolis nana. An individual of this species was found at Burghead, near high-water mark, May, 1853. In confinement it manifested all the activity and restlessness ascribed to it by the authors of the Monograph.

Eolis olivacea. At Burghead between tide-marks; not rare.

Eolis viridis. Not uncommon at Burghead about low-water mark.

Eolis picta. At Burghead between tide-marks; rare.

Eolis tricolor. Frequent at Burghead about the upper margin of the laminarian zone. Its habit, originally noted by Professor E. Forbes, of rolling itself up into a ball when teased, is certainly a decided feature of the animal.

Eolis Farrani. Rather common in the same situation as the preceding, at Burghead, where it has made its first appearance on the stage of British science in quite a new style of character, namely, with a development—in regard principally to colouring, but also in some degree to size—so superior to that represented in the Monograph as to give it, to the uninitiated eye, the appearance of a distinct species. As such, in fact, it was regarded here, till the illusion was dispelled by Mr. Hancock in lately receiving some specimens. Its newly-discovered features being about, we understand, to receive publicity in the concluding portion of the Monograph, any attempt at

description on our part is uncalled for, and would here be out of place.

Cenia Cocksii. A single specimen of this rare species of the Pelibranchiate order was found at Burghead near low-water mark.

GEORGE GORDON.

Birnie, by Elgin, July, 1854.

(To be continued).

Some American Snails naturalized in Yorkshire.—Some three or four years ago I procured a great number of living Mollusca (apparently several species of *Helix*) from a vessel recently arrived with cattle-bone from Buenos Ayres and Monte Video, in the cargo of which they abounded. These were turned out in the garden to take care of themselves, and now while I write a great number of them are still alive and apparently healthy. It is a fact worthy of note that coming from a semitropical country they have been able to withstand the region of our climate. The past winter would be a severe trial to them, the temperature on one occasion falling even so low as 3° below zero of Fahrenheit.—*G. Norman ; Hull, August 4, 1854.*

Note on Zygæna Minos.—So little is yet known respecting the new *Zygæna* in Britain, that it is hoped a few remarks made in a second Irish locality will not be uninteresting. In this neighbourhood I first noticed *Zygæna Minos* in the summer of 1851, but unfortunately then referred it to what is described as a suffused variety of *Z. Filipendulæ*, a mistake which may possibly have occurred to other collectors in England. The insect here appears about the first week in June, a fortnight earlier than *Z. Filipendulæ*, and is in perfection by the middle of the month: it then swarms on many parts of the rock-strewn pasture so characteristic of the mountain limestone district of the West of Ireland, where the stones frequently occupy the ground almost to the exclusion of vegetation. I have not yet succeeded in ascertaining its food, but, from the abundance in its haunts of *Lotus corniculatus* and *Anthyllis vulneraria*, it seems very possible that either or both of these constitute its diet. Some eggs laid on the 15th of June were hatched a few days ago, but I fear I shall not be able to rear the larvæ, through their refusing to eat. As regards the distribution of *Zygæna Minos* in Ireland, it occurs all round Castle Taylor, and I have also traced it within the limits of the county Galway as far as Garryland, eight miles south of this, and Tyrone, near Kilcolgan, four miles to the north-west: it is more particularly abundant towards the sea. From the prevalence in its favourite localities of certain plants,—such as *Gentiana verna*, *Dryas octopetala*, *Sesleria cærulea*, *Arbutus Uva-ursi*, &c., which are I believe common to a rather extensive tract in these parts, and especially characteristic of the Burrin mountains in Clare, where the insect was first taken by

Mr. H. Milner,—it seems probable that *Zygæna Minda* has also an extensive range through the district inhabited by these alpine plants, that is, in this county as far north as Galway and throughout the limestone district of the north of Clare: how far it may reach inland remains to be ascertained. An insect, too, which inhabits Germany, Switzerland and France, can hardly be expected to remain long peculiar to Ireland only of the British Isles, whether we look to Teesdale, from its botanical similarity, or to the Southern and Western counties for its occurrence in England.—*A. G. More; Castle Taylor, Ardahan, Ireland, July 15, 1854.*

Captures in Sutherlandshire.—As some of the readers of the 'Zoologist,' may like to know the result of a month's collecting in Sutherlandshire, I enclose a list of my captures. The locality in which I collected was about two miles in length, between Shin Bridge and Achany, and consisted chiefly of a birch wood, with a few alders and white poplars, and thick heather below. The whole of May was most unfavorable for collecting, as cold cloudy weather, with incessant wind all day, prevailed throughout the month. My primary object was salmon-fishing, but as I was out early and late I worked the place fairly. I have little doubt that any entomologist who would examine the mountainous part of Sutherlandshire would be well repaid for his journey. In *birds*, there was nothing particular to be noted. The woodcocks were very abundant, and flew round the woods regularly at dusk; but they appeared to have hatched their young very early, as, although I saw very many young birds, I did not meet with any unable to fly. There were several pairs of the red-breasted merganser flying up and down the river all day, but I did not succeed in finding any of their nests. The following is a list of the insects taken by me:—

Sesia bombylifformis.

Phragmatobia fuliginosa. Abundant both as larva and imago.

Orgyia fascelina. Larva abundant.

—— *Coryli.*

Lasiocampa Quercus. Larva on heath.

Odonestis potatoria. Larva.

Platypteryx lacertula. Very common on birch trees.

—— *falcata.* One specimen.

Cerura vinula. Very abundant.

Ceropacha duplaris. Larva.

Hadena adusta. Common on sugar.

—— *rectilinea.* Common on sugar, as early as May 22.

—— *glaucæ.* Common on sugar, and on willow-bloom.

Scopula ———. One specimen, very near *S. decrepitalis*, but Mr. Doubleday considers it a distinct species.

Mæsia favillacearia.

Tephrosia laticaria. Common.

Phæsyale psittacaria and *miaria.* On willow-bloom.

Lobophora lobularia. Abundant on willows.

—— *hexapteraria.* Abundant on white poplar.

Ephyra pendularia. Abundant on birch.

Eupithecia Callunaria. Abundant on heath.

Peronea Lipsiana. On willows; mostly worn specimens.

—— *ferrugana.*

Penthina prælongana.

Cnephasia lepidana and *maculana*. Very abundant everywhere.

Phoxopteryx unguicana.

———— *biarcuana*. On heather.

———— *Myrtillana*.

———— *lundana*.

———— *ramana*. Abundant on white poplar.

Cecyx argyrena.

Eupœcilia ruficiliana.

Semioscopis Steinkellneriana.

Incurvaria (Ehlmanniella).

———— *Zinkenii*. Abundant on birch.

Lampronia prœlatella.

Swammerdamia cœsiella.

Micropteryx Calthella and *Allionella*.

———— *Sparmannella*. On birch.

Nemophora Swammerdammellus and *sericinellus*.

Adela cuprella. On willow. Only one specimen this year, but abundant last year.

Gelechia proximella. Very common.

———— *longicornis*. May 10th.

Rœlerstammia prœnobella. New to Britain.

Gracilaria semifascia and *elongella*.

Ornix Loganella.

Chrysocorys festaliella.

Bucculatrix Demaryella. Flying.

Lithocolletis Caledoniella. Flying.

Pterophorus acanthodactylus. On heath.

Besides these, I took *Pyrochroa pectinicornis*, a species new to Britain, as Mr. S. Stevens informs me; a *Geometra*, allied to *rubidaria*; and two Tortrices, which Mr. Doubleday has not yet decided upon.—*E. C. Buxton; Adlington Hall, Chorley, July 6, 1854.*

Captures in Leicestershire.—*Trachodes hispidus*. I have much pleasure in announcing the occurrence of this rare *Curculio** in this county, four specimens of which were taken by Mr. F. Plant, on June 18th, in a wood a few miles distant from this town. On July 16th it again occurred, both to Mr. Plant and myself: altogether thirteen specimens have been captured by us. As the only two specimens previously found in Britain were taken some nine or ten years ago, the present capture bears the merit of a *rediscovery*.

Cyphon chrysomeloides. A single specimen of this species was taken from an oak tree, in June, by Mr. F. Plant.

Attelabus curculionoides. Sparingly, on oaks, in June and July.

Silpha quadripunctata. Sparingly, on oaks, in June and July.

Clythra quadripunctata. Sparingly, on oaks, in June and July.

Rhynchites pubescens. A few specimens from the hazel, June and July.

Brachytarsus varius. Ten or a dozen specimens of this rare *Curculio* have

* Described by J. Walton, Esq., in the 'Annals and Magazine of Natural History,' vol. ix. 2nd series, p. 204.

occurred in woods and on trees in their vicinity: they have been taken from the elm, the hazel, and by general sweeping in oak woods; June and July.

Elater balteatus. Four specimens, taken by Mr. Plant, from an old oak-stump, in June.

Elater bipustulatus. Three specimens, taken by myself, by sweeping in oak woods; July. This is the first time this species has occurred in this county.

Orobittis cyaneus. Plentiful in certain localities, by sweeping beneath oaks; June and July.

Agrilus viridis. Abundant in oak woods, in July.

Cryptocephalus minutus? and *labiatus*. Abundant in oak woods, in July.

Auchenia quadrimaculata. Locally abundant in damp parts of woods, on *Lysimachia nemorum*; July.

Leiodes humeralis. Sparingly, in damp woods, in July.

Amphicyllis globus (*Agathidium globus*, *Steph. Man.*) Sparingly, in damp woods, in July.

Haltica nitidula. Not uncommon on young aspens, in woods; June and October.

Haltica vittata (*Mus. Steph.*) Common on *Cardamine amara*; damp places in woods; May.

Lina ænea (*Melasoma ænea*, *Steph. Man.*) Common on young alders, in woods; June and September.

Donacia nigra and *Menyanthidis*. Locally abundant, on a species of grass? growing on the margins of ponds and rivers, in June. They secrete themselves at the base of the leaf where it enfolds the stem, a secure retreat from all but the prying eyes of their greatest enemy, the entomologist.—*Frederick Bates*; 5, *Napier Terrace, Aylestone Road, Leicester*, July 19, 1854.

Correction of an Error.—At page 4129 of the 'Zoologist,' I mentioned *Hydrilla caliginosa* as occurring on the heaths here; but having since ascertained that I had mistaken another species for *caliginosa*, I think it but fair to the Entomological world that the mistake should be corrected as publicly as made.—*Octavius Pickard-Cambridge*.

Note on the Barn Owl.—I heard to-day an anecdote respecting the barn owl which I think worth inserting in the 'Zoologist.' About fifty years ago a labouring man in a parish in this neighbourhood took a pair of young barn owls from their nest in a plantation, and brought them to a hollow elm tree which stood close to an adjacent farm-house: to this tree the young owls were tied by their legs for a time, and, on being subsequently released from this confinement, they took up their abode in the hollow trunk of the tree, which, from that day to this, has never been without a pair of barn owls for its tenants,—whether the original pair or their successors I am unable to say, but undoubtedly either the one or the other. Some years since, that part of the tree which the owls usually inhabited was blown down, and they seem to have felt no little reluctance in changing their domicile to another portion of it, as they were observed to keep possession of the fallen part of the tree most pertinaciously during the first night after the accident. Cats are well known to have very strong local predilec-

tions, and this anecdote makes it probable that the most cat-like of all birds, the owl, possesses a similar propensity.—*J. H. Gurney, Catton, Norfolk, August 8, 1854.*

Parrots at large in Norfolk.—In a wood in the neighbourhood of Cromer, in Norfolk, there are now living at large thirteen American parrots, two of the Amazon and eleven of the Carolina breed (both kinds are green, the former with a yellow crest). They are entirely at liberty, living upon the trees, but descending at regular hours to be fed, much in the same way as pigeons. They are hardy, do not appear to mind rain or wind, and have greatly improved in health and vigour and in beauty of plumage since they were set at liberty. One of the Amazon parrots has been enjoying its freedom for several years past, and the other for more than a year. In the autumn they feed themselves entirely on beech-nuts and acorns: last year these two did not return to the house for food or shelter for fourteen weeks, from the middle of August till the end of November, seldom, however, flying so far as a quarter of a mile from home, and generally answering when called. When the supply of beech-nuts and acorns at last failed they returned to the house to be fed, and as the weather became colder they generally spent the night in-doors, always—even in the great cold and heavy snow of last January in Norfolk—flying out for a part, at least, of the day. At the present time of year they remain wholly out of doors, but come to the window once a day to be fed, or fly down to any one sitting under the trees who will give them a piece of bread. They are perfectly tame and sociable, having always been allowed to come and go as they like, and will fly through the open window to the breakfast table, and out again when satisfied, without the least appearance of distrust. The Carolina parrots have been only lately turned out. Some pains were required, in the first instance, to teach them to come down for food, for they would not, as had been expected, consort with the Amazons, who, indeed, appear to despise the smaller Carolina race. However, by tying the wings of some of them and letting them out gradually, in about a week they were all at liberty, and had all learned where food was to be found. They are strong and active, flying round and round the place towards evening, sometimes over the trees and sometimes along the surface of the ground, with an occasional harsh cry, displaying very prettily their green backs and their long blue wings. They are greatly attached to the gardener who has the charge of them, and fly down from the trees to meet him as soon as he appears with their supper, perching on his head and shoulders, or upon the basin of bread and milk which he is carrying. During the autumn they will probably live on beech-nuts, but in the winter will require food, by which they will be induced to return at night into a small green-house, where they will find warmth and shelter whenever they like to avail themselves of it. If it were generally known how hardy, and at the same time how easily tamed, are both parrots and cockatoos, it is possible that these active and lively birds would be less frequently restricted to the irksome confinement of a small cage, but would be allowed the extreme enjoyment which they find in liberty and in the exercise of their natural habits.—*Communicated by Thomas Fowell Buxton, Esq., of Leytonstone.*

Occurrence of the Rose-coloured Pastor (Pastor roseus) near Dublin.—A fine adult male specimen of the rose-coloured pastor was killed near Dublin on the 20th of July. The man who shot it said there were three or four more in company with it.—*L. H. Juby, Dublin, August 9, 1854.*

Occurrence of the Rose-coloured Pastor in the Isle of Cumbrae.—The day before yesterday the footman rushed into the room to announce a “*rara avis in hortis*.” On

bastening out I was informed that the bird, which was of "the size and appearance of a blackbird, only with a white breast and back," had flown off. After waiting a short time, however, the stranger reappeared in the shape of *Pastor roseus*: it was being tormented by a flock of sparrows and yellowhammers, who seemed to regard him somewhat in the same light as we should his fellow-countryman a Zulu Kaffir. A gun was quickly procured, and the bird shot. I believe it to be of extreme rarity in Scotland. Yarrell (the only authority I have here with me) only mentions three instances of its appearance.—*Alfred Merle Norman; Isle of Cumbrae, August 7, 1854.*

Note on the occurrence of the Gray-headed Wagtail (Motacilla flava) at Lowestoft.—Mr. Thurtell, an intelligent bird-stuffer at Lowestoft (on whose observations I have full dependance), has sent me the following note on the above subject, which I have pleasure in forwarding for insertion in the 'Zoologist'.—"During the protracted dry weather from the beginning of last March to the end of April we had the wind from the North-east, with light sunny days, and every day for more than six weeks there were to be seen some forty or fifty yellow wagtails running upon our denes, and on the 24th of April I observed a gray-headed one amongst them. I fetched my gun and shot it. On the 25th I killed two more, and on the 26th I killed one. These four were all males; besides which I shot, on the 26th, two females.—*J. H. Gurney; Catton, Norfolk, July 24, 1854.*

Peculiarities of Grouse.—A correspondent in the neighbourhood of Carr-Bridge says, he noticed the other day a remarkable instance of that wonderful instinct which, even in the most timid of the feathered race, is sometimes found to inspire a courage almost supernatural in defence of offspring. As Mr. S. W. Hurrell was crossing the hill between Carr-Bridge and the Spey, on a fishing excursion, with some of his dogs following, one of them pointed, when a gray hen offered to do battle in defence of her brood, and flap, flapping her wings like fanners, Gallina, with heroic bravery, actually beat her canine antagonist, and, to the no small wonder of the party, drove him crest-fallen away. Another instance of the singular force of the same natural instinct may be mentioned. Mr. Bass, M.P., and his friends, who have taken the shootings around Carr-Bridge, are in the habit of giving presents to the herd-boys in the districts, in order to engage them, *bonâ fide*, to preserve the nests, and, if possible, guard them against external violence. One of the keepers lately accosted one of these herd-boys, and, in answer to several queries on the subject of nests, was told by the boy, that, in guarding the game from molestation, he had no difficulty except with one nest, which was situated in a place much frequented by the cattle, and which, he said, must have been destroyed unless by some means protected. 'But,' continued the boy, 'I have built a little house of stones and turf about it, and that will prevent the cattle from getting at it.' 'But,' replied the astonished keeper, 'you will certainly scare away the bird.' 'O no,' rejoined the boy, 'I have left a little door for the hen to get in and out at, and she sits on the eggs as usual.' The keeper, on visiting the place, actually found this to be the case; and several persons, attracted by curiosity, have seen the same singular phenomenon.—*Communicated by J. Gratton, Esq.*

Tufted Duck breeding at Osberton.—I beg to send, for insertion in the 'Zoologist,' the following interesting account of the discovery of the nest of a tufted duck at Osberton, in Nottinghamshire, by my nephew Francis Foljambe, Esq., this summer, and I cannot do better than quote his own words.—"On Tuesday, June 13th, 1854, I was informed by the keeper that he had discovered the nest of a pair of tufted ducks that

had been observed on the water at Osberton during the whole spring. I accordingly visited the spot and disturbed the female bird, who was then beginning to sit. The nest was formed of flags twined together like a waterhen's, but arched over, with the flags more open. There were seven or eight eggs lying in a little down, but I think the nest was not so thickly lined as a common wild duck's. I took three eggs from the nest, which were of a light olive-brown colour, and about the size of the widgeon's. When I returned home, after a short absence, I found the nest totally destroyed and the eggs gone. I had observed tufted ducks in pairs on the waters in the neighbourhood of Osberton as late as June 21, last year (1853), and felt certain they bred there then. The nest was close to the house, and within a stone's throw of the drawing-room window." I believe this interesting account of the tufted duck's breeding in this country is the first on record, though from the circumstance of their remaining with the pochard, which breeds in considerable numbers on Hornsea Mere, in Yorkshire, during the summer, I have no doubt that their nests might be found there.—*W. M. E. Milner* ; 75, *Eaton Place*, August, 1854.

Red-necked Phalarope killed near York.—A very fine specimen of the red-necked phalarope, in full summer plumage, was killed a few miles from York in May of this year, and was brought to Mr. Graham, bird-stuffer, by whom it has been set up, and is now in my collection.—*Id.*

Singular Hatch of Ducklings.—A neighbour of mine, a good housewife, sat a hen upon duck's eggs: in due time the hen brought off seven ducklings. There was nothing very unusual in this, but, strange to say, not one of them could stand, and they all came forth from their shells sprawling on their backs, with their flabby paws in the air, making, in their efforts to gain their natural position, a most ludicrous appearance. The parent bird and the good housewife made many attempts to help them on their legs and keep them there; but, as soon as their assistance was withdrawn, they instantly fell on their backs again. As may be concluded, they could not live long in such a state, and, after remaining in this strange position for about five hours, they all died. Can any of your ingenious correspondents explain this singular ornithological problem?—*R. Wakefield* ; *Sussex Place*, May 29, 1854.

Birds shot in Egypt.—The following is a list of birds which were shot in Egypt, between Alexandria and the first cataract of the Nile, during the months of November, December and January last, by myself and three friends. I have preserved specimens of most of them. With regard to the Egyptian vulture, which is generally figured and described as having yellow legs, I beg to observe that in the very numerous specimens which came under my notice, recently killed, and in every stage of transition from brown to white, the legs and feet were invariably pale flesh-colour, tinged with brown in the immature birds.

RAPTORES.

Griffon Vulture, *Gyps fulvus*.
 Egyptian Vulture, *Neophron percnopterus*.
 Imperial Eagle, *Aquila Mogilnik*.
 Spotted Eagle, *Aquila navia*.
 Booted Eagle, *Aquila pennata*.
 Long-legged Buzzard, *Buteo rufinus*,
 (Rüppell).
 Lanner Falcon, *Falco Lanarius*.

Peregrine Falcon, *Falco peregrinus*.
 Double-bearded Falcon, *Falco cervicalis*.
 Merlin, *Falco aesalon*.
 Kestrel, *Falco tinnunculus*.
 Sparrow-hawk, *Accipiter nisus*.
 Arabian Kite, *Milvus Egyptianus*.
 Black-winged Kite, *Elanus melanopterus*.
 Marsh Harrier, *Circus rufus*.

Hen Harrier, *Circus cyaneus*.
 Montagu's Harrier, *Circus cineraceus*.
 White Owl, *Strix flammea*.

Egyptian Horned Owl, *Bubo Ascalaphus*.
 Little Owl, *Noctua nudipes*.

INSESSORES.

Gray Shrike, *Lanius excubitor*.
 Blue Rock-Thrush, *Petrocincla cyanea*.
 Black Wheatear, *Saxicola cackinnans*,
 (Gould).
 Russet Wheatear, *Saxicola Stipazina*,
 (Gould).
 White Wagtail, *Motacilla alba*.
 White-winged Wagtail, *Motacilla lugubris*.
 Gray-headed Wagtail, *Motacilla neglecta*.
 Crested Lark, *Alauda cristata*.
 Hooded Crow, *Corvus cornix*.
 Starling, *Sturnus vulgaris*.
 Tree Sparrow, *Passer montanus*.
 Common Sparrow, *Passer domesticus*.

Vinous Grosbeak, *Erythropsiza githaginea*,
 (Gould).
 Hoopoe, *Upupa epops*.
 Crag Swallow, *Cotyle rupestris*.
 Common Swallow, *Hirundo rustica*.
 Swift, *Cypselus apus*.
 Isabella Goatsucker, *Caprimulgus isabel-
 linus*.
 Black and white Kingfisher, *Ceryle rudis*.
 Egyptian Bee-eater, *Merops Egyptius*.
 Great Spotted Cuckoo, *Cuculus glandarius*.
 Straight-heeled Coucal, *Centropus Sene-
 galensis*.

RASORES.

Gray-backed Pigeon, *Columba intermedia*.
 Cambaian Turtle, *Turtur cambaiensis*.
 Singed Sand Grouse, *Pterocles exustus*.

Senegal Land Grouse, *Pterocles senegal-
 ensis*.
 Quail, *Coturnix vulgaris*.

GRALLATORES.

Common Heron, *Ardea cinerea*.
 Buff-backed Heron, *Ardea russata*.
 Night Heron, *Nycticorax Europeus*.
 White Stork, *Ciconia alba*.
 Spoonbill, *Platalea leucorodia*.
 Norfolk Plover, *Ædicnemus crepitans*.
 Spur-winged Plover, *Hoplopterus spinosus*.
 Black-headed Plover, *Pluvianus Egyptius*.
 Little Ringed Plover, *Charadrius minor*.
 Lapwing, *Vanellus cristatus*.
 White-tailed Plover, *Vanellus leucurus*.
 Common Curlew, *Numenius arquata*.

Black-winged Stilt, *Himantopus mela-
 nopterus*.
 Green Sandpiper, *Totanus ochropus*.
 Common Sandpiper, *Totanus hypoleucos*.
 Marsh Sandpiper, *Totanus stagnatilis*,
 (Gould).
 Greenshank, *Totanus glottis*.
 Common Snipe, *Scolopax gallinago*.
 Jack Snipe, *Scolopax gallinula*.
 Short-winged painted Snipe, *Rhynchæa
 bengalensis*.

NATATORES.

White-fronted Goose, *Anser albifrons*.
 Egyptian Goose, *Anser Egyptius*.
 Shoveller Duck, *Anas clypeata*.
 Mallard, *Anas boschas*.
 Pintail Duck, *Anas acuta*.

Teal, *Anas crecca*.
 Cormorant, *Carbo cormoranus*.
 Gull-billed Tern, *Sterna anglica*.
 Small Gull.

Birds seen by myself, but not obtained.

Osprey, <i>Pandion haliaetus</i> .	Black Stork, <i>Ciconia nigra</i> .
Raven, <i>Corvus Corax</i> .	Pelican, <i>Pelecanus onocrotalus</i> .
Common Kingfisher, <i>Alcedo ispida</i> .	Large Gull.
Common Crane, <i>Grus cinerea</i> .	

—E. C. Taylor; Chicknell, Bridgenorth, Salop, July 23, 1854.

The Lesser Weaver (*Trachinus vipera*).—The perusal of an interesting note (Zool. 3260) by the Rev. George Harris, upon the weevers, reminds me of a circumstance which occurred within my own knowledge. A few years ago, when spending a week in the South of England with a party of friends, we were invited by a gentleman to have a sail in his yacht for Calais. We were leaving the harbour of that place, upon our return home, when one of the seamen who handled the vessel, having been paddling in the water with bare feet, put one of them upon what he called a "sting-fish," and which, judging from all the circumstances, I have no doubt was the lesser weever. His leg became painful, and in the course of a few hours much swelled and inflamed, and upon reaching England he was obliged to desist from following his nautical duties. By the aid of medical treatment the inflammation gradually abated, but many weeks elapsed before he was able to resume his usual occupation.—*John Joseph Briggs; King's Newton, Derbyshire, July, 1854.*

Things hoped for. By JOHN SCOTT, Esq.

"Are these things then necessities?
Then let us meet them like necessities:—
And that same word even now cries out on us."
Shakspeare, Henry IV. Part 2.

"TIME and the hour runs through the roughest day," and our father's weary limbs refuse to bear them further. They are saying to us, 'These works which we are about to leave behind us, have been designed for your benefit, making the way much easier for you than when we first set out on our journey. Walk steadily in the same path; imitate our example, and hope for excellence; amend what you may prove to be in error, and cherish such as is without fault.' Time and the hour are doing for us what our fathers now feel. We are fast slipping into the "sere and yellow leaf." It is coming upon us with thief-like footsteps, and shortly the account of the stewardship will be called for. Undoubtedly their places ought to be

supplied from amongst us, but who is there amongst us able to supply them, when they shall be hid from our sight for ever? Truly it is a question which ought to touch us deeply, and make us think a little less of ourselves than we have been in the habit of doing. Many of us are yet but very infants in the science. We have collected together a great many species, and made it our boast that such and such are in our possession. We have spent large sums in obtaining the rarer insects, and some who have done so had only in view their possession of them, that they might gloat over them and say, 'I gave so much for this, is it not a valuable addition?' The silver net has done more towards enriching many collections in a few days than weeks of industry has done for the working-collector. How many have lived in the neighbourhood of some of the choicest things for a length of time without ever discovering that they were there, and when shown them would scarcely believe the tale. However, damp feet and a little fatigue may be easily avoided by the payment of a few shillings. Now, I do not wish to be misunderstood, nor have it thought that I wish merely to treat my brethren rudely. Far be it from me to do so. It is my desire and wish, that from amongst us may spring up men with minds so large as to be able to compete with those departed and on the wane, and at the same time to be as free to communicate to their humble followers as these last are to emulate them. Nor would I have them lean too much on any one as a guide. Our science is not yet so perfect but that some other paths may be made, or those already made better harmonized. A man can never be an entomologist, nor any other *ologist*, if he sits continually by his fireside. He must betake himself to the fields and woods and see Nature as she is; study her carefully and record her lessons faithfully in his book. He must feel that

"All places that the eye of heaven visits
Are to a wise man ports and happy havens;"

that necessities have come so thick upon him, unless he uses, now his utmost efforts all his former doings are as nothing. For what is a collection of insects, though it were the finest in the kingdom, if its possessor sees only skin-deep into their usefulness and design. It appears to me to resemble very much a man with a library, formed of the choicest authors of various languages, and of which he can make no use; or as a child with a picture-book, very well to please the eye.

Then we very much want carefully compiled local lists, published in such a periodical as the 'Zoologist,' containing not merely the record of the capture of the insects themselves, but of their times of appearance, and, as far as practicable, notices of their previous stages, the food of the larvæ, and whether common. Nor must any one who takes such a task upon himself be tied to old names and defunct lists: he must travel with the age. This has been done, but such have only surface views. For it is a very erroneous and stupid notion, to think that because a new nomenclature has been adopted by recent authors, that these authors are taking liberties. Believe me they know better than those who cavil at such seeming innovations. There is also a necessity for adhering to one system, for without one accepted rule we should be for ever in confusion, as soldiers in a field without a leader, we should not know whom to follow. Then we want popular lectures delivered on Entomology: this would be a great feature, and it also bears its necessity with it. The artisan and the mechanic have done not a little towards the advancement of the study in our land: they have been a great means in making us familiar with many of the rarer insects; and surely the alehouse would be robbed of many a visitor were this course adopted: they would be taught to see the benefits which they would bestow on themselves and others; they would be raised from the sensual to the spiritual; their minds would become enlarged, and another link in the great chain grasped by an Almighty hand would appeal to their senses, and declare to them his Divine wisdom. Barren and stony indeed would be the ground, and its richer parts overrun with foulest reptiles, if all the seed that fell should find no rooting-place, or spring up only to be devoured.

Then we want the collectors of Micro-Lepidoptera, in their various districts, to gather the larvæ, each collector attaching himself to a genus, and only quitting it for another after he is satisfied that he has fairly worked out of his ground all that it possesses. He could retain a portion of each kind he might meet with, for the purpose of studying their economy; for familiarizing himself with their habits; and for being able to point out to others what might be expected from such a case-bearer, such a miner, &c.: the other portion could be sent to Mr. Stainton or to Mr. Douglas, these gentlemen being only too anxious to find useful correspondents in such matters. The necessity for this may be learned by perusing the Prospectus enclosed in the February number of the 'Zoologist,' or by referring to

the papers published in the Entomological Society's 'Transactions,' by Mr. Douglas.

These are one or two of the necessities most to be desired by all who are desirous of being ranked as entomologists; things which no single man by himself can ever hope to get through, and the little which each one might perform, were it only the discovery of a single new species (I mean the transformations), would serve to show that he was pulling in the right direction, that is, towards the removal of the great difficulties which have hitherto enveloped these interesting creatures, and which has hitherto prevented their being so well known by us; and to finish, I would say to each one,

"Teach thy necessity to reason thus;
There is no virtue like necessity."

JOHN SCOTT.

Ferry Road, Renfrew,
Feb. 27, 1854.

NOTICES OF NEW BOOKS.

'*Geodephaga Britannica. A Monograph of the Carnivorous Ground-Beetles indigenous to the British Isles.*' By JOHN FREDERIC DAWSON, LL.B. London: Van Voorst, 1854. Demy 8vo. 212 pp. text, 3 plates.

WE believe that there is no man in the United Kingdom so capable of undertaking the task which is here completed as Mr. Dawson; and we unhesitatingly pronounce the work an invaluable contribution to British Entomology. Mr. Dawson is not merely one of those who labour with unwearying assiduity at any subject towards which they feel a drawing, but he possesses a more rare and more useful faculty, the power of methodising his labours, so that they may be available to others. The subject investigated by Mr. Dawson is surrounded with difficulties: the species themselves are obscure; the prior descriptions are very imperfect; and the synonymy is involved in all but inextricable confusion: nevertheless our pains-taking author has dissipated much of the obscure, unveiled the tangled synonymy, and

thrown a flood of light on every part of his subject. Hence it is with sincere pleasure that we recommend the 'Geodephaga Britannica' to our readers, as a work that must take its place beside those classics of British Entomology, Haworth's Lepidoptera, Kirby's Bees, and Shuckard's Fossorial Hymenoptera.

Having said thus much, it seems desirable to add a few critical remarks, in order to prove to our readers and the author, *first*, that we are really acquainted with the work we are praising; and, *secondly*, to point out little matters that we think susceptible of improvement.

The greatest fault in the book we consider to be the want of uniformity in the *commencement* of the detailed English descriptions: we have a *penchant*, perhaps amounting to a weakness, for those little aids which adherence to a formal plan always affords: we would not dictate to an author that he should treat colour, or sculpture, or size, as of paramount importance, but we would, if we could, confine him to something like order in this respect. Now, Mr. Dawson's definitions appear *in this respect* to be without order: we do not assert, or even hint, that there is no order, or that the descriptions themselves are insufficient, but that, on the very threshold of the definitions, colour, form, size and diagnosis are perplexingly mingled. Of course we must illustrate this; and we might possibly do so with some humour, and certainly with some effect, were we to select extreme examples from different parts of the book; but a more ingenuous, though less illustrative, course, is to take a dozen consecutive species in the same genus, and quoting each definition as far as the first comma: here they are:—

"Anchomenus lævis. Head and thorax greenish brass,

"A. viduus. Larger than lævis,

"A. mæstus. This species is rather smaller than viduus,

"A. atratus. The form of this species is intermediate between those of mæstus and fuliginosus,

"A. fuliginosus. Head black,

"A. gracilis. This species is much more delicately formed than the preceding and differs in several particulars,

"A. scitulus. Shining black,

"A. micans. Oblong ovate,

"A. piceus. Head and thorax black,

"A. pelidnus. Elongate,

"A. Thoreyi. Head black or pitchy black,

"A. quadripunctatus. This rare and remarkable species is smaller than any of the preceding,"—pp. 88—95.

It will be seen that five of these definitions have reference to colour, three to magnitude, and four to form; five of them are, moreover, comparative, the reader in most instances being unacquainted with the name of the insect with which the author compares them: thus the name of *Anchomenus lævis*, which, by the way, is equivalent to the more familiar *Agonum parum-punctatum*, does not we believe exist in any prior work, or in any cabinet whatever, British or Foreign; so that we have a second problem added to the first;—we have to find out what *Anchomenus lævis* is, and what are its dimensions, before we can contrast it with *Anchomenus viduus*; and so on with the rest. In connexion with this subject, we take the liberty of observing that each of the long paragraphs comprising these English definitions should have been broken into four, and arranged thus:—

[*Head*, black, smooth and shining, with an oblong impression on each side between the antennæ, which, with the palpi, are black, &c.

Thorax, greenish black or olivaceous or entirely black, the breadth in the middle greater than the length, sides rounded and deeply margined, and the margins broadly reflexed, especially at the hinder angles, &c.

Elytra, greenish brass, ovate, much broader than the thorax, shoulders rounded and sometimes elevated, sides widest behind the middle, apex obliquely sinuated, &c.

Obs.—Larger than *lævis*, but resembling it in form].

A second observation we venture to make, is that the author sometimes guesses, when he might have readily ascertained the truth. Example:—

"*Helobia impressa*. I have not seen this insect: it probably belongs to *Nebria nivalis*," Prel. Obs. viii.

Who would not have preferred to have read as follows:—

"I have carefully examined the series of specimens of this insect, and without hesitation refer them to *Nebria nivalis*."

Again, sticklers as we are for priority in nomenclature, we conceive that the love of change may perhaps carry the principle too far: at page 167 we find the name of "*Trechus rubens*" substituted for that of "*Bembidium paludosum*." Mr. Dawson thinks that our familiar insect *may be* the *Carabus rubens* of Fabricius, but this conclusion does not result from an examination of the original specimen or the original description.

From Mr. Dawson's changes of orthography we must express unqualified dissent: thus, in "*Aëpus*," altered to "*Aëpys*," we think

the change highly objectionable: 1st, it subverts the law of priority; 2ndly, it is inelegant; 3rdly, the alleged *unde derivatur*, "altus pro profundus" is conjectural. Again, the word "Orinonum" is altered to "Orinomus," in violation, as we opine, to the laws of elegance, euphony and grammar.

These critical observations, will, we think, show that we have carefully gone through this valuable volume. We regret that works of this character know no second edition, or we should advise the author maturely to consider our views; as it is, suggestions for improvements are useless.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

August 7, 1854.—H. T. STANTON, Esq., Vice-President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors: — 'Annales de la Société Entomologique de France,' 2me Série, tome x. 1852, and 3me Série, tome i. 1853; by the Society. 'Mémoires de la Société de Physique et d'Histoire Naturelle de Genève,' tome xiii. 2me partie; by the Society. 'Journal of the Royal Agricultural Society of England,' vol. xv. part 1; by the Society. 'Monographie des Guêpes Sociales,' cahier 6; by the Author, M. H. de Saussure. 'Revue et Magasin de Zoologie,' 1853, No. 10, and 1854, Nos. 5 and 6; by the Editor, M. Guérin-Ménéville. The 'Athenæum' for July; by the Editor. The 'Literary Gazette' for July; by the Editor. The 'Journal of the Society of Arts' for July; by the Society. The 'Zoologist' for August; by the Editor. 'Entomologische Zeitung,' for May and June; by the Entomological Society of Stettin. 'A List of the British Tineina, for interchange among collectors and for labels;' by the Author, H. T. Stanton, Esq. Specimens of *Anthrocera Minos* for distribution among the Members; by A. G. More, Esq.

Election of a Member.

J. R. Turner, Esq., Manchester, was elected a Subscriber.

Exhibitions.

Mr. Boyd exhibited *Limacodes Asellus*, ♂ and ♀, recently taken in the New Forest.

Mr. Ingpen exhibited a box of Australian Diptera and Hymenoptera, chiefly from the vicinity of Adelaide. He also exhibited an exotic wasps' nest, but by what species made he was not aware, which he had examined microscopically, and found to be w^b "

composed of fungoid matter. He thought it probable that the nests of some of our native species were not made altogether of wood, as is generally believed, and in corroboration of this idea exhibited a piece of decayed wood from one of the cedars in the Botanic Garden at Chelsea, in which was a layer of fungus, and wasps, he said, were observed to frequent this tree for building materials.

Mr. Curtis said he had often seen wasps scraping off and carrying away particles from wooden palings where there certainly was no fungus.

Mr. Wing said he had recently seen wasps carrying away the pile from the leaves of a species of mullein.

Mr. Stevens exhibited a drawing of a variety of a larva of *Acherontia Atropos* made by a gentleman, who thought it might be a distinct species, but the imago reared from it (which was also exhibited) proved to be only a very slight variety; and Mr. Westwood, referring to Fuessly's 'Archives,' showed that the same variation from the ordinary colour of the larva was there figured.

Mr. Stevens also exhibited the very rare species of *Curculionidæ*, *Trachodes hispidus*; this single specimen having been taken by Mr. Plant, of Leicester, by sweeping under oaks in a wood near that place.

Mr. Boddy exhibited a living specimen of the rare *Ludius ferrugineus*, of which the larva was found in a rotten ash tree near London, on the 3rd of September, 1853, and the beetle appeared on the 9th of July last. He also exhibited a living larva of the same species, respecting which Mr. Westwood observed the last segment of the body had not the least denticulation, thus affording a good character for generic distinction.

Mr. Douglas exhibited a series of specimens of *Grapholita nisella*, *Linn.*, bred from catkins of willow and poplar, including all the varieties *Pavonana*, *Berberana*, *cuspidana*, *rhombifasciana* and *cinerana*, which had been placed together by Mr. H. Doubleday, and might now be deemed without doubt to be but one species.

Notes on Irish Sphæriæ.

Mr. A. R. Hogan, of Dublin, sent the following communication respecting two examples of a *Sphæria*, accompanied by the specimens referred to.

"The Lepidopterous larva bearing the *Sphæriæ* now laid before the Society was taken by me on the 10th of March, 1853, while digging for pupæ at the roots of an oak tree in Mount Merrion, a demesne belonging to the Right Hon. Sidney Herbert, and not far distant from the place where I live. The *Sphæriæ* were at the time quite young, the tallest not being more than a quarter of an inch in height; and the species appeared to be the same as that on a former occasion (5th July, 1852), exhibited at a meeting of the Entomological Society, with no apparent difference but that of the shoots being somewhat stronger and thicker. The following entry appears in my notebook, made on the 12th of April:—'On examining the larva taken last month, which by Professor Harvey's advice has been kept moist in a jam-pot filled with clay and moss, and covered with a piece of glass, I found fully a dozen fresh sprouts on it, pure white, and one of them about the height of a line, shaped like the point of a dagger. From that time the *Sphæriæ* continued to grow, some more and some less rapidly, for several months, always retaining the white point at the end of each stem, generally covered with small drops of moisture, till at length the cold of winter seemed to deaden, though it did not destroy, their vitality. Meantime none of the shoots showed any

sign of fructification, without which Professor Harvey said that it would be impossible to identify the species. In autumn I tried the experiment of placing a dead larva of *Pygæra Bucephala* and one or two other species in the same pot where the *Sphæriæ* were growing, in order to see whether any of the seed might be communicated to these larvæ from the moss (as in the first instance I met with evidently was the case), but without the desired effect.

"As early spring opened the *Sphæriæ* again threw out fresh shoots, some of the latter forming branches from the old ones whose extremities had withered away: this will be seen by an examination of the specimen, and it will also be remarked that there is a great diversity in the relative size of the shoots, one or two of them being so fine and delicate as hardly to be perceptible at first sight. At this stage of their growth, however, the space in which they were confined being manifestly too small, and seeming to cramp their existence, I could not resist the temptation (though from the great delicacy of the plants I knew it would be attended with risk) of transferring the whole into a larger vessel, where they might enjoy more space, more light and more air; but this experiment proved fatal, from what special cause I know not, and the entire nursery died away by slow degrees.

"I should previously have stated that the other example of *Sphæria* now exhibited, that of the chrysalis, was found at the foot of an old hawthorn tree at Roebuck, on the 27th of January of this year,—that the large shoot was then about an inch long, which length was soon trebled,—and that it came to its end in the same way and along with its brethren.

"In putting together these notes I have merely detailed the facts that fell under my own observation, and seem to come within the sphere of entomologists; the investigation of the plants and of their origin I leave to the botanist: yet, in conclusion, I may mention that as far as I can learn there has not hitherto been recorded any instance in Ireland similar to the one just described: the Rev. Joseph Greene indeed informs me that he saw a specimen at Powerscourt, but, as he did not preserve it, no further light can from this circumstance be brought to bear on the subject."

This kind of parasitism of vegetable upon animal bodies being rare, especially in Europe, it is to be hoped that Mr. Hogan may succeed in finding other specimens and rearing them to maturity.

Species of Trochilium and Cynips reared from American Oak-galls.

Mr. Westwood stated that from some galls of *Quercus palustris* received from North America, and deposited in the Museum in the Botanic Gardens at Kew, several specimens of a species of *Trochilium* had emerged, two of which he now exhibited. The larvæ had doubtless fed in the galls, although such a proceeding was quite abnormal to the genus, their excrement being visible near the apertures where the pupa-cases were left projecting. He could not find that the species had been noticed by Dr. Harris, in his 'Monograph on the American Sphingidæ,' and he had therefore described the insect in the 'Gardener's Chronicle,' under the name of *T. Gallivorum*. Among the galls he also found specimens of the *Cynips* causing the formation, which he had described under the name of *C. palliceps*. The following are the descriptions referred to:—

"*Trochilium Gallivorum*.—Measures 8 lines in the expanse of the fore wings and 5 lines in the length of the body. It is of a blue-black colour, with two slender, pale yellow diverging lines on the sides of the thorax above, and with the edges of the tail also pale yellow; the wings are transparent, except the dark fore margin, a curved bar across the middle, and a pale brown apical border; the legs are yellow, with a dark ring round the tibiæ near the tips."

"*Cynips palliceps*.—Of a black colour, with the head and front and under parts of the thorax pale yellow; the males are distinguished by the large size of their heads. Length rather less than 2 lines."

Economy of Evania.

Mr. Westwood said a connection between *Blatta* and *Evania* had often been noticed without the nature of it having been understood: he had recently had an opportunity of investigating the subject, a correspondent having sent him some egg-capsules of an exotic species of *Blatta* imported with Orchidaceous plants, and he had found *Evania* appendigaster, in the several states of larva, pupa and imago, within these capsules.

Captures by Mr. Curtis.

Mr. Curtis said that when on a visit recently to Mr. Dale, at Glanvilles Wootton, he had taken the following insects:—*Myrmica graminicola*, ♀ only; *Ephyra orbicularia*, June 10th, a fine ♂; *Crambus uliginosus*, June 15th to July 1st; *Limnobia 6-guttata*, Hal., June 15th to July 1st; *Acentropus Garnorisii*, June 15th to July 1st. Concerning the latter insect he should make a communication at a future Meeting. At Clifton he saw Mr. Walcott's beautiful collection of bees, from which he exhibited two captured with the wings in a rudimentary state. At Mr. Vaughan's, at Bristol, he noticed the method of capturing small moths in glass tubes, invented by Mr. Brown, of Burton-on-Trent, and exhibited a sample.

Singular Beetle found in South-American Ants' Nests.

Mr. Westwood read a notice, accompanied by drawings of dissections, of a very curious beetle found by Mr. Bates in ants' nests, in the Valley of the Amazon, possessing the characters of several families, and so anomalous that it was very difficult to indicate its nearest relationship; and he further remarked that it was very singular that all the many Coleopterous insects found in ants' nests should have some peculiarity of form or structure. He described the present species under the name of *Gnostis Formicicola*.

New British Hemerobii, &c.

Mr. Curtis read a paper on two new British species of Hemerobius, with remarks upon the synonymy of *Coniopteryx*, &c.—J. W. D.

A List of the Mollusca hitherto found in the Province of Moray and in the Moray Firth. By the Rev. GEORGE GORDON.

(Concluded from page 4435).

Gasteropoda Pulmonifera.

Common large Black Slug or Snail, *Arion empiricorum*, (*A. ater*, Mac.) Abundant.

Garden Arion, *Arion hortensis*. Has been met with in several localities, and a species probably generally dispersed throughout the district. Manse garden at Birnie; near Mill of Birnie; wood at Main. Mr. Martin has found it at Foresterseat. An Arion not unfrequent in the moist grassy upland cultivated parts of Moray, a specimen of which was sent to Mr. Hancock and seen by Mr. Alder, is considered by these gentlemen to be the variety of *A. hortensis* noticed in the 'Catalogue of Northumberland and Durham Mollusca.'

Field Slug, *Limax agrestis*. Very abundant.

Spotted Gray Slug, *Limax cinereus*. Occasionally met with in gardens and in deep shady ravines.

Tree Slug, *Limax urborum*, (*L. marginatus*, Mac.) At Birnie, 1853, among leaves fallen from lime trees.

Cellar or Yellow Slug, *Limax flavus*, (*L. variegatus*, Mac.) Although a specimen of this slug has not been compared with the description in Messrs. Forbes and Hanley's work, yet it is believed that it is occasionally to be found in cellars and in other damp half-sunk apartments, both in the country and in the county towns of the Province of Moray.

Little Brown Slug, *Limax brunneus*. This species is probably more generally dispersed than naturalists have hitherto been aware of. It is not uncommon in the district comprehended in this list. At some places, as at the escarpment of red conglomerate, near Mill of Birnie it is to be found, of a damp warm evening, in abundance. Mr. Macdonald remarks that this little slug is the most lively and fearless of its tribe. When disturbed, instead of contracting itself into a lump, like most of its congeners, it makes bold and repeated efforts to escape from the annoyance.

Green Glassy Snail, *Vitrina pellucida*. Common.

Cellar Zone-shell, *Zonites cellarius*, (*Helix nitida*, Flem.) Under stones at the fish-beds at Dipple, Mr. Martin; Bridge of Divie near Relugas, and at the old castle of Dunphail, Mr. J. Shand.

Garlic-scented Zone-shell, *Zonites alliarius*. Very common.

Nitidulous Zone-shell, *Zonites nitidulus*. Near Cothall on the Findhorn, *Mr. Martin*; old castles of Spynie, Duffus, Dunphail and Burgie, and Bridge of Daltilich, *Mr. J. Shand*.

Clear Zone-shell, *Zonites purus*. Among damp moss near Relugas, and woods at Grange near Kinloss, *Mr. J. Shand*.

Minute Striated Zone-shell, *Zonites radiatulus*. Avenue leading from Barmuckity to Foresterseat, and in the Oakwood near Elgin, *Mr. Martin*; abundant in damp moss in many localities, *Mr. Macdonald*.

Lucid or Shining Zone-shell, *Zonites nitidus*, (*Z. lucidus*, Mac.) Near Foresterseat, *Mr. Martin*.

Crystalline Zone-shell, *Zonites crystallinus*. Frequent. Among moss, Teethill Wood, *Mr. Martin*; Dunphail, Relugas, Bridge of Daltilich and wood at Grange, *Mr. J. Shand*.

Spotted Garden Snail-shell, *Helix aspersa*. Abundant in gardens at Elgin, particularly on the north side of the town. At Lossiemouth and in other localities of the Province.

Single-banded Snail-shell, *Helix arbustorum*. Near Duncow's Loup on the Lossie, and also on the Findhorn, *Mr. Martin*; near old castle of Dunphail, *Mr. J. Shand*.

Common Garden Snail-shell, *Helix nemoralis*, (*H. hortensis*, Flem. and Mac.) Common, particularly about limestone dykes or quarries. *Mr. Martin* remarks, "there is a peculiarity in the history of *H. nemoralis* that I cannot account for. In some seasons they appear in countless numbers, while in others a few only are found here and there. I remember one day walking along the links, east of Burghead, and seeing the ground covered with them, so much so that it was difficult to move a step without crushing some of them. I have visited that locality several times since, and the most that I could obtain did not amount to a dozen. I remarked a similar occurrence at Spynie. One day after a summer shower the stone dyke around the Spynie plantation was covered thickly with them, but ever since I have not found a single specimen there, although I have visited the place often after a summer shower. What had become of them?" The late Sir Thomas Dick Lauder, in his very graphic account of the Moray Floods of 1829, states that he found the empty and decayed shells of this species at so high a level above the sea as the calc-tuffa beds of Inchrory on the Avon, Banffshire, and supposed that it had become extinct there from some deterioration of the climate. This interesting spot was visited the next year, and many

were found alive, some of which were forwarded to the learned Baronet, who at once allowed that his theory was no longer tenable. The celebrated bank at Inchroary is of far purer lime than any marl, being a solution made by the water percolating the limestone beds, and deposited in the form of calc-tuffa as soon as it emerges to the surface. Its origin therefore cannot be, as Sir Thomas affirmed, "the exuviae of aquatic Helices." Mr. Macdonald finds the variety *hortensis* the most common form, but has also collected the typical *memoralis* as well as the variety *hybrida* at Burghead.

Wrinkled Snail-shell, *Helix caperata*. Abundant on stone dykes at Inverugie, and near Lesmurdie cottage, Mr. Martin; at and around Burghead, Mr. Murray; near Gray's Hospital, and between Bishopmill and Oakwood, Mr. Macdonald.

Silken Snail-shell, *Helix sericea*, (*H. hispida*, Flem.) Near Cothall, on the Findhorn, Mr. Martin; old castle of Dunphail, Mr. J. Shand.

Pyramidal Snail-shell, *Helix fulva*, (*H. Trochilus*, Mac. and Flem.) Among leaves on the banks of the Findhorn, near Foresterseat, and in an old quarry in the wood of Main, Mr. Martin; Burghead, Mr. Murray; Lesmurdie cottage, &c., Mr. Macdonald.

Little White Snail-shell, *Helix pulchella*, (*H. costata*, Flem.) Abundant, but local. Near Lesmurdie cottage, Mr. Martin; Burghead, Mr. Murray.

Radiated Snail-shell, *Helix rotundata*, (*H. Turtoni*, Flem., *Zonites rotundatus*, Mac.) At the old castles of Spynie and Duffus, Mr. Martin; Burghead, Mr. Murray; Kinloss Abbey, and also near Oakwood Elgin, Mr. Macdonald.

Sharp-pointed Bulimus, *Bulimus acutus*. It is not without some hesitation that this pretty species is here included. It was observed in rather a suspicious locality, a mantel-piece, to form a considerable portion of shells almost wholly native, and collected on the Caithness coast near Duncansbay head, and presented to the Rev. James Leslie, of Burghead. As it is found plentifully in some parts of Skye, near the sea, the probable Caithness locality cannot be objected to as too northerly a range for this shell.

Lustreless Bulimus, *Bulimus obscurus*. Rather rare. At Boghole on the Brodie burn, and at Cothall on the Findhorn, Mr. Martin; old castle of Dunphail, Mr. Macdonald.

Umbilicated Chrysalis-Snail, *Pupa umbilicata*, (*P. muscorum*, Flem.) Common. "Particularly abundant among the ruins of the bridge, at the south end of the avenue leading from Barmuckity

Foresterseat, the rivulet being well known to many of his friends as the Rubicon of the late Mr. Leslie, of St. Andrews, Lhanbryde," *Mr. Martin*.

Margined Chrysalis-Snail, *Pupa muscorum*, (*P. marginata*, Flem. and Mac.) Abundant near the sea among moss and under stones, *Mr. Martin*; on the top of an isolated rock, washed by the sea at Cummingston, among the roots and decayed leaves of *Elymus arenarius*.

Toothless Chrysalis-Snail, *Pupa edentula*, (*Vertigo edentula*, Mac.) Rare. Kirkhill wood, *Mr. Martin*; wood near Lesmurdie cottage, *Mr. Macdonald*; Dunphail, Grange, and Milton-Brodie, *Mr. J. Shand*.

Pigmy Chrysalis-Snail, *Pupa pygmæa*. Rare. Two specimens have been found by Mr. J. Shand, under stones, near the old castle of Dunphail.

Marsh Chrysalis-Snail, *Pupa antivertigo*. Rare. Marshy ground opposite the gate of Lesmurdie cottage, *Mr. Macdonald*.

Reversed Balea, *Balea fragilis*, (*B. perversa*, Flem. and Mac.) Agatey rock at the back of Stotfield, *Mr. Martin*.

Dusky Clausilia, *Clausilia nigricans*, (*C. perversa*, Flem.) Plentiful at Craigellachie Bridge, *Mr. Martin*; Burghead, *Mr. Murray*.

Glossy Zua, *Zua lubrica*, (*Bulimus lubrica*, Flem. and Mac.) Generally dispersed and abundant. Sheriffston, Main, Linksfield, &c., *Mr. Martin*; Mr. Murray finds it frequently in the neighbourhood of Burghead.

Oval Amber-shell, *Succinea putris*. In pools and ditches at Waterymains, and at the north side of Innes House, *Mr. Martin*; Tyock, *Mr. Macdonald*.

Ferruginous Bubble-shell, *Physa hypnorum*, (*Aplexa hypnorum*, Flem.) Pools at Foresterseat, and on the north of Innes House, *Mr. Martin*.

Bristly or White Coil-shell, *Planorbis albus*. Burn of Outlet, *Mr. Macdonald*.

Smooth Coil-shell, *Planorbis glaber*. Canal near Lochside Tile-works, *Mr. Martin*; ditch on the farm of Inverlochty, *Mr. Macdonald*.

Nautilus Coil-shell, *Planorbis Nauteilus*, (*P. imbricatus*, Mac.) Rare. Ditch on the farm of Inverlochty, *Mr. Macdonald*; more plentiful in a small pool in a damp plantation south-east from the Manse of Duffus, *Mr. Murray*.

Round-edged Flat Coil-shell, *Planorbis spirorbis*, (*P. vortex*, var. β .,

Mac.) Common in ditches, &c. around the Loch of Spynie, and throughout "the featureless flat" (Duffus).

Contorted Coil-shell, *Planorbis contortus*. In the same localities as the last species.

Shining Lenticular Coil-shell, *Planorbis nitidus*. - In canals and ditches around the Loch of Spynie; Order Pot, *Mr. Martin*; near Lesmurdie Cottage, *Mr. Macdonald*.

Wandering Mud-shell, *Limnæus pereger*, (*Jymnea lutea* and *L. limosa*, Flem.) Very common. *Mr. Martin* states that he has often been amused in watching the movements of this species in the old canal north of Inchbroom, when hundreds of these creatures were seen sailing from one end of the canal to the other, foot uppermost. Their wandering propensities were always exhibited when they had the advantage of a favourable wind, and when the wind was westerly those that were at the west end made a voyage to the eastward; and again, when the wind changed, a large body of them were seen returning. What their motives were in this movement it is difficult to say,—whether in quest of food, on visits of friendship, or on pleasure excursions. When they had fairly started on their voyage they resembled a fleet of herring-boats in miniature. The shells of *L. pereger* in this canal, adds *Mr. Martin*, are larger than any that he has seen in the North.

Little Mud-shell, *Limnæus truncatulus*, (*L. fossaria*, Flem.) Frequent. Linksfield, and in pools near Loch of Cotts, *Mr. Martin*; Burn of Outlet, west from Burghead, with *L. pereger*, *Mr. Murray*.

Marsh Mud-shell, *Limnæus palustris*. In ditches near the north gate of Innes House, *Mr. Martin*; in a small grassy puddle between Burghead and Cummingston, *Mr. Murray*; ditch near Castle of Spynie, *Mr. Macdonald*.

Oval Lid-shell, *Ancylus fluviatilis*. Burn of Forres and Burn of Lhanbryde, where large varieties are found, *Mr. Martin*; Linkwood Burn and in the Lossie, *Mr. Murray*.

Small Carychium, *Carychium minimum*. Abundant among leaves near Darnaway Castle, and at the Teethill Wood, *Mr. Martin*; marsh below Lesmurdie Cottage, and near Allarburn, *Mr. Macdonald*; Relugas and Dunphail, *Mr. J. Shand*.

Cephalopoda dibranchiata.

Pennant's Cuttle-fish, *Eledone cirrhosus*, (*Octopus octopodia*, Flem.; *E. Pennantii*, Mac.) One partially mutilated, but retaining

sufficient distinctive marks, found on the shore at Stotfield, January 20th, 1854.

Rondeletius' Little Cuttle-fish, *Sepiola Rondeletii*. Several specimens of small cuttle-fish have of late years been found in different parts of the Moray Firth, and a few have been taken from the stomach of the haddock; but all of them seem to agree with the description of this species, as given by Messrs. Forbes and Hauley, and show no difference in the arrangement of the suckers in the lower pair of arms.

Common Cuttle-fish, *Loligo vulgaris*. This is by far the most common of the larger Tenthidæ that are found on the Elginshire coast, where it is not unfrequent, particularly towards the end of summer. Occasionally numbers of them are found enclosed in the salmon-nets. The fishermen know them well by the name of "Troolians."

Middle-sized Cuttle-fish, *Loligo media*. "Has recently been caught at Peterhead, on the east coast of Scotland, by Mr. Peach," *F. & H.*

Officinal Cuttle-fish, *Sepia officinalis*. As in many other localities, the few cuttle bones picked up at different times on the shore, form all the evidence that can as yet be adduced to show that this species, "one of the most beautiful and curious of British mollusks," inhabits the waters of the Moray Firth. As intimately connected with the subject of this paper the following notice is quoted from page 3864: "I beg leave to place on record, through the pages of your journal, the capture of *Onychoteuthis Banksii*, *Leach*, at Bahff, N. B.—*John Rose, M.D.R.N., Haslar Hospital, Gosport, March 14, 1852.*"

Additional Species.

Minute Turtonia, *Turtonia minuta*. This small shell has been lately discovered by Mr. Macdonald to be not unfrequent between tide-marks at Burghead. It has also been found among shell-sand from Caithness.

Four-angled Arca, *Arca tetragona*. A few valves have been taken from the Caithness shell-sand. (The reference made to this species in Zool. 4316 may be deleted).

Smooth Cæcum, *Cæcum glabrum*, (*Cæcalium glabrum*, Mac.) "Several specimens among small shells sent (to Dr. Macgillivray) by Mr. Alexander Murray, who found them at Fraserburgh," *Mollusca of Aberdeenshire*, p. 39.

Additional Localities, &c.

Since the first part of this list was printed several specimens of *Circe minima*, along with one of *Astarte triangularis*, have been found in shell-sand from Caithness.

In place of one, as stated (Zool. 4435), Mr. Murray found several specimens of *Cenia Cocksii*, on Algæ, that were gathered between tide-marks, and put into a small vivarium. These rare mollusks were first observed while crawling up the sides of the glass vessel. Mr. Macdonald, to whom they were sent in the first instance, forwarded them to Mr. Hancock, who obligingly named them.

Mr. Macdonald has lately obtained several specimens of *Eolis nana* at Burghead, on shells and zoophytes from deep water.

Tritonia plebeia has also been got by him in great abundance, on *Alcyonium digitatum*, dredged off Lossiemouth.

The following table will exhibit a comparison between this district and some others where the molluscos tribes have been examined and the result published. The first column (B.) contains the numbers in the 'History of British Mollusca,' by Messrs. Forbes and Hanley, as given by Mr. Templer (Zool. 3992). The second column (M.) contains the number of species hitherto discovered in the Firth and Province of Moray. The third column (A.) contains the numbers of those species of Dr. Macgillivray's 'Mollusca of Aberdeenshire, &c.', that remain after the doubtful and spurious species, so called by Messrs. Forbes and Hanley, have been excluded. The fourth column (N.) is made up from Mr. Alder's 'Catalogue of the Northumberland and Durham Mollusca.' And the last column (D.) from Mr. Walpole's papers on the Dublin Mollusca (Zool. 4022 and 4101).

		B.	M.	A.	N.	D.
I.	<i>Acephala tunicata</i>	75	6	4	30	
II.	<i>Acephala lamellibranchiata</i>	181	97	88	108	101
III.	<i>Acephala palliobranchiata</i> (Brachipoda)	5	1		1	
IV.	<i>Pteropoda</i>	4	1			
V.	<i>Gasteropoda prosobranchiata</i> . . .	221	89	72	110	70
VI.	<i>Gasteropoda opisthobranchiata</i> . . .	113	43	18	59	8
VII.	<i>Pulmonifera</i>	101	46	44*	80	50
VIII.	<i>Cephalopoda</i>	14	5	4	6	
Sum of species...		714	288	230	394	229

* Including *Oarychium minimum* (see Mr. Taylor's list, Zool. 3880), and also "var. B." of *Planorbis vortex*, viz., *spirorbis*, as a distinct species.

The following species have been found in the Firth and Province of Moray, but are not in the 'Mollusca of Aberdeenshire,' viz.:— I. *Botryllus Schlosseri*, *Ascidia sordida*, *Molgula arenosa*, *Pelonaia corrugata*. II. *Psammobia Tellinella*, *Tellina Balaustina*, *T. Donacina*, *T. pygmæa*, *Astarte arctica*, *Cardium nodosum*, *C. Suecicum*, *Nucula nitida*, *Arca tetragona*, *Pecten striatus*, *Turtonia minutâ*. III. *Crania anomala*. IV. *Spirialis Flemingii*. V. *Chiton Hanleyii*, *C. ruber*, *C. albus*, *C. marmoreus*, *Acmaea testudinalis*, *Pilidium fulvum*, *Fissurella reticulata*, *Trochus alabastrum*, *T. undulatus*, *Lacuna puteolus*, *L. crassior*, *Rissoa Zetlandica*, *R. Beanii*, *Skenea rota*, *Cerithium adversum*, *Scalaria Trevelyana*, *Aclis nitidissima*, *Chemnitzia fulvocincta*, *C. indistincta*, *Odostomia cylindrica*, *O. decussata*, *Eulimella Scillæ*, *E. acicula*, *Natica sordida*, *N. Helicoides*, *Lamellaria perspicua*, *Fusus propinquus*, *Mangelia nebula*, *M. brachystoma*, *M. costata*, *Marginella lævis*. VI. *Akera bullata*, *Scaphander lignarius*, *Aplysia hybrida*, and twenty-six species of Nudibranchs. VII. *Arion hortensis*, *Limax brunneus*, *Helix sericea*, *Bulimus acutus*, *Pupa pygmæa*, *P. antivertigo*, *Physa hypnorum*, *Planorbis glabra*, *P. nitidus*. VIII. *Loligo media*.

The following species, described by Dr. Macgillivray, have not been found in the Firth or Province of Moray, viz.:— II. *Syndosmya tenue* (*Amphidesma tenue*), *S. alba* (*Amphidesma album*), *Kellia nitida* (*Lepton nitidum*), *Cardium pygmæum* (*C. exiguum*), *Lucina leucoma*, *Pisidium amnicum*. V. *Bithinia tentaculata* (most likely introduced), *Buccinum Dalei* (*Halia Flemingii*), *Cæcum trachea* (*Cæcalium trachea*), *Lachesis minima*, (*Buccinum minimum*, most likely introduced), *Rissoa vitrea*, *Rissoa ventrosa*, *Odostomia insculpta*, *O. plicata*, *Truncatella Montagui* (*Eulima nitidissima*), *Chemnitzia elegantissima* (*Eulima elegantissima*). VI. *Philine catena* (*Bulla catena*). VII. *Planorbis vortex*, *Physa fontinalis*, *Helix fusca* (*Zonites fusca*), *Helix pygmæa* (*Zonites pygmæa*), *Helix aculeata*, *H. lamellata*, *H. hispida*. Such is the relation, so far as is known, of two northern and neighbouring districts. By future researches these now somewhat numerous lists will be diminished gradually, until a catalogue of the land and marine Mollusca of Aberdeen become almost equivalent to that of Moray. The same sea washes both shores; and the soil, the situation, or the climate of the one district does not differ so much from that of the other as to lead one to expect that the difference of Fauna indicated by these lists will long continue so marked as it now appears.

The present difference, however, between the Molluscan Fauna of Dublin and of Moray, as shown by the next two lists, will probably get more marked than otherwise, as these two so widely separated localities continue to be explored by naturalists.

Species not uncommon in the neighbourhood of Dublin, but rare or not found at all in the Firth or Province of Moray, viz.:—*Solen marginatus*, *Syndosmya alba*, *Lepton squarrosus*, *Ostrea edulis*, *Trochus umbilicatus*, *Phasianella pulla*, *Rissoa inconspicua*, *Cerethium reticulatum*, *Scalaria communis*, *Chemnitzia elegantissima*, *Murex erinaceus*, *Nassa reticulata*, *Trophon muricatus*, *Mangelia costata*, *Philine aperta*.

Species that are rare or that are not found at Dublin, but not uncommon in Moray, viz.:—*Cochlodesma prætenue*, *Kellia rubra*, *Unio margariferus*, *Anadonta cygnea*, *Leda caudata*, *Pinna pectinata*, *Trochus Helicinus*, *Littorina neritoides*, *Rissoa punctura*, *R. rubra*, *Skenea planorbis*, *Natica Montagui*, *Cylichna cylindracea*, *C. truncata*, *Bulla Cranchii*, *Philine scabra*, *Aplysia hybrida*.

Specimens, collected from the Firth and Province of Moray, of all the testaceous species enumerated in this paper, are now placed in the Elgin Museum, except the following, viz.:—*Tellina Donacina*, *Nucula nucleus*, *Pecten varius*, *Crania anomala*, *Spirialis Flemingii*, *Chiton Hanleyii*, *Pisidium fulvum*, *Puncturella Noachina*, *Cæcum glabrum*, *Eulimella Scillæ*, and *Akera bullata*. Most of these eleven are rare in any locality, but specially so in the Moray Firth. It is hoped, then, that those who have it in their power to supply local specimens of any of these desiderata will do so, and the more readily, when they know that their valuable donations go not to enhance any private, but to complete a public collection, open to the stranger interested in such pursuits, as well as to the resident student of the provincial zoology. It need scarcely be here added that another boon would be conferred by the gift of specimens of, or information regarding other mollusks, whether testaceous or not, that have been observed in the Province or Firth of Moray, but which are not recorded in this paper as denizens of the district.

An earlier opportunity should have been taken than at the close of this paper, gratefully to acknowledge the assistance so obligingly given during its compilation, by Robert McAndrew, Esq., of Liverpool. Though late, this acknowledgment, however, is not the less

heartily offered now. By his successful researches much new and important light has been thrown on the distribution of the European Mollusca generally; but the North of Scotland, where it is believed he first acquired a taste for this study, has been in this respect peculiarly indebted to him. His experience among the northern forms and species enabled him to identify and name the various specimens submitted to him, while his readiness and kindness in replying to the many queries put to him enhanced the valuable information he communicated.

Corrections.

As the author of this paper had not the opportunity of correcting the proof sheets, several errors have crept into the text. A few of the more important may be thus corrected, viz.:—

- Page 4302, lines 21 and 22, *for four read two, and dele Lacuna puteolus and Mangelia turricola.*
 „ 4303, line 10, *dele and Trochus undulatus.*
 „ 4310, line 34, *for Circe read Venus.*
 „ 4313, line 26, *for Donovan read Doveran.*
 „ 4316, line 37, *place a period after Elgin Museum.*
 „ 4317, line 11, *place a period after Buckie, deleting the comma.*
 „ 4318, line 22, *for Spiralis, read Spirialis.*

GEORGE GORDON.

Birnie, by Elgin, N. B.
 September, 1854.

Some Remarks on the Marine Fauna of the South of Devon.

By WILLIAM F. TEMPLER, Esq.

LONG and constant observation of the Natural History of a county is necessary to produce anything like a complete Fauna, and there are few men to whose lot it falls to be equally well acquainted with all branches of so extensive a pursuit. During many years acquaintance with the south-western counties of England I have become familiar with their coasts, their rivers and estuaries, and their productions, from the mussel, attached to the sea-beaten rock by its strong byssus,

to the small Rissoa, quietly passing its life in the retirement of some small nook beneath a stone in some warm rock-pool.

The coast of Devonshire, from the days of Montagu and Turton down to its numerous ardent collectors of the present day, has always been famous for the richness of its marine Fauna, which, owing to the labours of its numerous and energetic naturalists, receives annual additions to its already extensive list. During two years' residence at the small and pretty watering-place of Budleigh-Salterton, on the South coast of Devon, situated on the Otter, having Sidmouth on the East and Exmouth on the West, and by the aid of temporary residences at Dawlish and Plymouth, I have been enabled to complete my examinations of nearly the whole length of the sea-board of Devon. Many of the former inhabitants of the deeper and more inaccessible parts of the Channel now also repose in the drawers of my cabinet, the result of many pleasant and long-to-be-remembered dredging excursions, in the society of one who for a period of sixteen years has almost identified himself with these coasts, and whose boat, dredges, and his still more valuable services through many a long summer's day, have done much towards any merits that these elucidations of the mysteries of the sea may possess.* In forming a Fauna of a line of coast of many miles, consisting of varied features, the difficulty arises as to the best method of bringing the facts into order. There are two methods; one, the progress of a tour through a country in the manner it is undertaken; and the other according to the classification of Zoology, as Zoophytes, Mollusca, &c. Each plan has its own peculiar advantages; but as I prefer the second, as requiring the least repetition, I will give a preliminary description of the general outline of the coast of Devon, from the vicinity of Lyme Regis to the commencement of the Cornish coast.

Shortly after leaving Lyme Regis, in Dorsetshire, the blue lias begins to disappear, and on arriving at the small watering-place of Seaton the chalk and green sand make their appearance: the Axe here loses itself in the sea. On the opposite side of the river is the fishing hamlet of Beer Regis; and its lofty cliff of chalk, known as Beer Head, is a striking headland, and is the last chalk to the westward. From hence to Sidmouth runs a long pebble beach of some miles, backed by cliffs of red sandstone and green sand intermixed, the cliffs presenting beautiful slopes to the South, and laid out in strawberry gardens; the cliffs rising all the way towards Sidmouth, where

* C. S. Harris, Esq., of Budleigh-Salterton.

they attain their elevation in Salcombe cliff, which then descends rapidly to the valley of the Sid. Running up this valley is Sidmouth. The cliffs, now all red sandstone, again rise abruptly, and attain their elevation in the peak cliff. From the summit a rapid descent terminates in the beautiful and quiet little bay of Ladram, with its caves and rocky headlands, the favourite haunts of the cormorant and the guillemot. Most delightful and remunerative is it here on a fine day in summer, at low-water spring-tides, to examine the rock-pools, whether for sea-weeds, zoophytes or mollusks.

From here to the mouth of the Otter the cliffs vary in height and are much weather-worn, the softer parts of the rock decaying, while the harder parts remain, leaving frequent holes in the face of the cliff: these holes are found very useful by the various winged inhabitants which during the breeding-season are numerous here, and add much to the interest of the locality. There are some deep pools near Brandy Head, from which I have obtained many good things. The next headland is Otter Point, which may be called the eastern horn of Salterton Bay, and Straight Point the western. Off Otter Point a high ledge of large rocks extends a long way out towards the sea, and is a lucrative spot to the collector: from here to Littleham Cove is a shingle beach, but which is sometimes productive in zoophytes after rough seas. Littleham Cove abounds in rock-pools of varied depth.

Slapton Sands is also an interesting place for the collector, and a few days may be most pleasantly spent at its comfortable hotel. The beach is of a peculiar nature, being composed entirely of small round quartz pebbles, about the size of beans, which are constantly being rolled up and down channel, not being able to pass round Start Point. A fine wild bay to the west of the Start, most accessible from Salcombe, and in which immense quantities of sea-weed are thrown up in rough weather, is well worthy of a visit.

The estuary of Salcombe next deserves attention, and, whether for its beautiful walks, its peculiar geological features, its natural productions, or the historical associations connected with its castle, or for all combined, the tourist, if possible, should bestow more than a passing visit, especially as comfortable lodgings are to be procured commanding pleasant views of the estuary.

Between here and Plymouth is Bigbury Bay, in which, a little way from the shore, is Burr Island, well known to the collector of Mollusca, and which is accessible from the shore at low water.

Plymouth terminates the Devonshire coast, and will be found an inexhaustible locality to the dredger, but the constant movements of

steamers and sailing-vessels render dredging in a small boat anything but pleasant, and is at times even dangerous. From the Plymouth trawlers are to be obtained some good things, but they are a rough set of men and very mercenary, and have some extraordinary ideas of the value of what they bring, although without any reason, as on one occasion I had to pay them 10s. for the most worthless rubbish.

MOLLUSCA.—*Acephala Lamellibranchiata.*

Pholadidea papyracea. Perforating the red sandstone rocks of the South Devon coasts, at very low-water spring-tides. A good locality for them is eastward of Exmouth.

Corbula nucleus. The Warren, Exmouth, but not common.

Thracia pubescens. From the Plymouth trawlers.

Solen ensis. Common on the Warren, Exmouth.

Psammobia Ferroensis. On the beach, Dawlish, after easterly winds.

Tellina incarnata. Warren, Exmouth; rare.

„ *tenuis.* Warren, Exmouth.

„ *fabula.* Warren, Exmouth.

Donax anatinus. Beach to westward of Dawlish after easterly winds; at times abundant on the Warren, Exmouth; mud-sand by Otter mouth, Budleigh-Salterton, by dredge.

Macra solidus. Warren, Exmouth; Shaldon, Teignmouth, near low-water mark and by the ferry; also on Slapton Sands.

„ *stultorum.* At the mouth of the Otter, in mud-sand, not far from shore, and at times taken in the mackerel-nets; Budleigh-Salterton.

Tapes decussata. Teignmouth, by the Shaldon ferry.

„ *pullastra.* Not uncommon amongst the shingles, Exmouth, and also at times on the Warren.

Venus casina. Plymouth trawlers.

„ *striatula.* May be found on the Warren, Exmouth, and also to the westward of Dawlish after easterly winds.

„ *fasciata.* May be dredged in Salcombe estuary; bright-coloured specimens by dredge not far from shore, Budleigh-Salterton.

„ *ovata.* Salcombe estuary, by dredge.

Lucinopsis undata. On the Warren, Exmouth, and by the ferry, Teignmouth.

Cyprina Islandica. Plymouth trawlers.

Cardium echinatum. On the Warren, Exmouth, and the Slapton Sands.

„ *Norvegicum*. On the beach, Dawlish, after easterly winds; Budleigh-Salterton, in mud-sand, not far from shore, by dredge.

Kellia suborbicularis. Rock-pools to the east of Exmouth; in the bulbs of *Laminaria bulbosa*, Budleigh-Salterton; and frequently may be found between the dead valves of *Pecten opercularis* when they have become tightly bound together by *Serpula*.

„ *rubra*. Abundant in *Lichina pygmæa*, Ladram Bay and Littleham Cove, near Budleigh-Salterton.

Lepton squamosum. Fine, but not common, in clay, half a mile off Sherbrooke Lake, Budleigh-Salterton, by dredge.

Cyclas cornea. Ditches by Otter, Budleigh-Salterton.

Modiola barbata. To the west of Dawlish after easterly winds, but not common.

Crenella marmorata. Buried in the coats of *Ascidians*, small, but numerous on the beach to the west of Dawlish.

Nucula nucleus. Mud-sand off Budleigh-Salterton, by dredge.

„ *radiata*. Very large and fine-coloured off Budleigh-Salterton, by dredge.

Pecten tigrinus. Budleigh-Salterton Bay, by dredge, about a mile from shore in the coralline zone.

Pecten maximus. May sometimes be obtained in Exeter Market: they are also taken by the Brixham trawlers; also dredged in Salcombe estuary. Three of this fine mollusk were cast on the beach, Budleigh-Salterton, after a heavy winter's gale.

„ *opercularis*. Frequently cast ashore alive to the west of Dawlish; Slapton Sands, alive; the var. *lineatus* may be obtained from the Plymouth trawlers.

Gasteropoda Prosobranchiata.

Chiton fascicularis. Amongst the mussels, Langstone Cliff, between Exmouth and Dawlish and headland to west of Dawlish.

Chiton cinereus. Most abundant half-way between tide-marks to the west of Dawlish.

Chiton lævis. I obtained one specimen from Compass Bay, to the westward of Dartmouth.

Patella athletica. Littleham Cove, Budleigh-Salterton.

Acmea virginea. Attached to dead shells, Salcombe estuary.

Pileopsis Hungaricus. From the Brixham trawlers.

Calyptræa Sinensis. Salcombe estuary.

Emarginula rosea. Salcombe estuary.

Trochus zizyphinus. Littleham Cove, Budleigh-Salterton between tide-marks.

„ *Montagui*. Salcombe estuary.

„ *tumidus*. Salcombe estuary.

„ *magus*. May at times be found alive on the Warren, Exmouth, and also on Slapton Sands.

Phasianella pullus. This pretty mollusk may be found living and creeping over the sea-weeds in the rock-pools at Littleham Cove, but they are not very numerous.

Bithinia tentaculata. Ditches by the Otter, Budleigh-Salterton, common.

Valvata piscinalis. In ditches, with the above.

Rissoa striata. Abundant beneath stones in a large wild bay between the Prawle Point and the Start Point.

„ *semistriata*. From a mass of sponge or group of zoophytes (*Crisidia*), Budleigh-Salterton.

„ *cingillus*. Amongst the crevices of the rocks beneath the Hoe, Plymouth, not uncommon; Littleham Cove, rare; Salcombe estuary, not uncommon.

Rissoa Ulvæ. Most abundant on the stones and mud at the salt-pans by Mount Pleasant, between Exmouth and Dawlish; also on a grassy flat by the mouth of the Otter, in *Bostrichia Scorpioides*.

Aporrhais pes-pelecani. May at times be procured alive from the Warren, Exmouth; off Budleigh-Salterton, by dredge.

Aclis ascaris. Amongst the zoophytes from the Plymouth trawlers.

Eulima polita. Fine specimens off Budleigh-Salterton, by dredge, not far from shore.

„ *bilineata*. Middle ground off Budleigh-Salterton, by dredge.

Chemnitzia rufa. Rock-pools, Littleham Cove.

„ *fenestrata*. Plymouth Sound.

Odostomia Rissoides. Abundant amongst the mussels, Langstone Cliff, between Exmouth and Dawlish, and cliff to westward of Dawlish.

Odostomia truncatula. Plymouth trawlers, rare.

Natica momilifera. Frequently found alive on the Warren, Exmouth, and also to the west of Dawlish; also on Slapton Sands.

Cerithiopsis tuberculare. I obtained forty or fifty specimens from a small piece of red sponge dredged off Budleigh-Salterton.

Nassa reticulata. I have found a few alive on the beach, Dawlish.
Buccinum undatum. Frequently found alive on the Warren, Exmouth.

Mangelia purpurea. Off Budleigh-Salterton, by dredge.
 „ *linearis*. Attached by a byssus to *Sphacelaria* washed up on the beach, Budleigh-Salterton.

Cyprea Europea. Common on the Warren, Exmouth.

Ovula patula. From the Plymouth trawlers.

Marginella lævis. Occasionally from the Plymouth trawlers.

Gasteropoda Opisthobranchiata.

Torniatella fasciata. The Warren, Exmouth.

Philine aperta. Common in mud-sand not far from shore, Budleigh-Salterton, and sometimes it may be found on the Warren, Exmouth.

Aplysia hybrida. In some seasons most abundant in Littleham Cove, near Budleigh-Salterton.

Pleurobranchus membranaceus. Exmouth and Salcombe estuary.

„ *plumula*. Exmouth.

WILLIAM F. TEMPLER.

Largs, Aberdeenshire,
 August, 1854.

P.S. I am preparing a list of the Zoophytes of the coast, which I hope to have ready in the course of the winter.

Entomological Botany (with more especial reference to the Plants frequented by the Tineina). By H. T. STAINTON, Esq.

THE relation between plants and phytophagous insects is somewhat similar to that between geological strata and the fossils imbedded in them; we should laugh at the idea of a collector of fossils travelling about the country in search of them, yet totally uninformed as to the different strata in which they occur: nevertheless, hitherto little surprise has been evinced at the neglect which Botany experiences from entomologists, and, on the other hand, it seems surprising how rarely a first-rate botanist turns his attention to Entomology, though from his knowledge of plants he would start with an immense advantage in the race.

In 1791 Jacques Brez published, at Eltrecht, his '*Flore des Insectophiles*,' being a list of plants frequented by insects, showing also the insects which frequented them: in the '*Isis*,' 1846, Dr. Speyer and his brother gave a catalogue of plants used as food by Lepidopterous larvæ; but this also was a simple catalogue of names, and I am not aware that any writer has attempted this interesting subject in the mode in which I propose to treat it.

The plants are enumerated in the order in which they occur in Babington's '*Manual of British Botany*.' Information concerning the larvæ of Noctuæ has been largely drawn from Guenée's '*Histoire Naturelle des Noctuelites*.' European species not already detected in this country are here mentioned, provided the food-plant is a native, in which case the insect may be expected to be met with.

It must, however, be preliminarily observed that many larvæ are polyphagous, and some, such as those of the Sciaphilæ, to such an extent that it would be difficult to discover plants on which they do not feed: these must be left to the practical experience of the collector, since to enumerate the polyphagous species under each plant on which they feed would be a great waste of time and paper.

Clematis vitalba. Travellers' Joy.

A common plant on chalk and limestone, and growing in such masses that it is extremely probable the larvæ of several Micro-Lepidoptera feed on it. The reputed Nepticula larva on the leaves of this plant (see Zool. 3955) is now ascertained to be Dipterous. Speyer enumerates three of the Geometridæ as feeding on this plant,—*Chlorissa vernaria*, *Phibalapteryx tersata* and *P. Vitalbata*.

Thalictrum flavum. Common Meadow Rue.

An inconspicuous plant growing in wet fields, flowering in June and July. The singular Noctua, *Calpe Thalictri*, the sole European representative of an extensive exotic family, and which has not hitherto been noticed as British, is attached to this plant. The larva, reminding one of a *Cucullia* larva in shape and colour, feeds *à découvert* on this plant, in May.

Anemone nemorosa. Wood Anemone.

So plentiful in woods (especially where the underwood has recently been cut down) and thickets; its white blossoms attracting the attention of the most unobservant in April and May.

From the time that Fischer-von-Röslerstamm figured on this plant the larva of *Adela Degeerella*, it has been thought to be an especial food-plant for that insect. This may, however, be doubted, the larva feeding, according to Fischer, on several low plants, and according to the observations of Lyonnet (published posthumously), more in the style of *Incurvaria mascolella* and *pectinea*, on withered leaves.

Ranunculus. Crowfoot; Buttercup.

A numerous genus, of which a few species give the prevailing yellow colour to our hay-fields in summer; and an elegant one with white flowers is the ornament of many a little pool of stagnant water, in April.

Speyer gives *Ranunculus bulbosus* as a food-plant for *Orthosia pistacina*; but among the Micro-Lepidopterous larvæ, I am not at present aware of any specially attached to this genus: the polyphagous lively black larva of *Sericoris lacunana* may frequently be observed feeding on the flowers; and, as is well known, the perfect insect of *Micropteryx Calthella* delights to bask in the sun on the flowers of several *Ranunculi*.

A mining Dipterous larva (*Phytomyza flava*, *Meigen*) is excessively abundant on the leaves of *R. repens* and others, and is even specially mentioned in a Botanical work, Dr. Johnston's '*Terra Lindisfarnensis*,' p. 28:—"The leaves are often marked with pale sinuous lines, which are produced by the burrowings of a caterpillar that finds a favourite food in their parenchyma."

Caltha palustris. Marsh Marygold.

Abundant in moist meadows, flowering in May. Frequented by the perfect insect of *Micropteryx Calthella*, but not at present known as the food of any Lepidopterous larva.

Aquilegia vulgaris. Columbine.

Not frequently met with in a wild state, but common in gardens. Speyer represents *Polia dysodea* and *Boarmia crepuscularia* as feeding on it.

Delphinium consolida. Field Larkspur.

In sandy or chalky corn-fields this beautiful plant occurs. The shark-like larva of *Chariclea Delphinii* feeds on this plant, in July: it is gregarious when young; it keeps near the top of the plant feeding

on the seeds and green capsules: it is an extremely rare British insect.

Berberis vulgaris. Barberry.

Also an abundant garden plant. Speyer enumerates *Ennomos illunaria*, *lunaria*, and *illustraria*, *Anticlea berberata*, *Triphosa certata*, and *Eupithecia exiguata* as feeding on it. According to the observations of Tischer (in Treitschke) the larva of *Gelechia Mouffetella* (though most partial to honeysuckle) also feeds on barberry; and, according to Geyer's observations (also in Treitschke), the larva of the conspicuous *Gelechia Scopolella*, not yet detected in this country, feeds in June, between flatly united leaves of this plant.

Nymphæa alba. White Water-Lily.

Nuphar lutea. Yellow Water-Lily.

With the exception of the aquatic larva of *Hydrocampa Potamogata* and *Nymphæata*, no Lepidopterous larvæ are known to feed on these ornaments of our ponds and streams.

Papaver Rhæas. Common Red Poppy.

We are still unacquainted with any Lepidopterous larva attached to this plant; yet it seems probable there must be some which have escaped our observation.

Glaucium luteum. Yellow Horned Poppy.

The same remark applies to this as to the preceding; but we are so little acquainted with the productions of our maritime plants, that the non-observance of a *Glaucium*-eater is less remarkable.

Chelidonium majus. Celandine.

Speyer represents the polyphagous *Euplexia lucipara* as feeding upon this plant.

Corydalis claviculata. White Climbing Fumitory.

Fumaria capreolata. Rampant Fumitory.

Fumaria officinalis. Common Fumitory.

No Lepidopterous larvæ have been hitherto observed on these plants.

THE CRUCIFERÆ.

As the larva of *Plutella cruciferarum* feeds apparently indifferent-

on most of the species of this order, it is most appropriately mentioned before enumerating the individual species.

Cardamine Pratensis. Common Lady's Smock. (Bitter Cress.)

Frequented, when blooming in May, by the perfect insect of *Adela rufimitrella*. The common *Anthocharis Cardamines* probably feeds in the larva state on this plant, but it rather appears polyphagous with respect to several of the *Cruciferae*, having been observed on *C. impatiens*, *Turritis glabra*, &c.

Hesperis matronalis. Dame's Violet.

Grown very commonly in gardens, and much frequented by the larva of *Plutella porrectella*.

Sisymbrium officinale. Hedge Mustard.

Alliaria officinalis. Jack-by-the-Hedge.

Both common plants, the latter being rather conspicuous in May, but neither is at present known as the special food of any *Lepidopterous* larva.

Brassica oleracea. Cabbage.

Best known in the form it assumes in the kitchen-garden, where it is frequented by the larvæ of *Pontia Brassicæ* and *Rapæ* (also according to Speyer, Napi and *Daplidice*), *Triphæna pronuba*, *Mamestra oleracea*, *Brassicæ* (and according to Speyer, *suasa*, and *Chenopodii*), *Botys forficaris* (and according to Speyer, *Scopula margaritalis*): many of these species probably feed also indifferently on the turnip.

Sinapis arvensis. Charlock Wild Mustard.

This plant which abounds to such an extent that it gives a uniform yellow colour to corn-fields, in May, is still unknown as the special resort of any *Lepidopterous* larva.

Draba verna. Common Whitlow-grass.

This elegant little harbinger of spring, so common on walls and dry banks, is not known as the food of any *Lepidopterous* larva: its white flowers begin to expand before the end of March.

H. T. STAINTON.

Mountsfield, Lewisham,
September, 1854.

(To be continued).

Extract from a Letter of a Gold-Digger.

By EDWARD T. INGPEN, Esq.*

WHATEVER good fortune the gold-digger may meet with, believe me he well deserves it. To say nothing of the separation of domestic ties and the want of the comforts of civilized life, and such like small matters, he is the victim of continual persecutions. Take Zoology as an instance; he is a martyr from day to day; he rises in the morning unrefreshed (I will tell you why presently), and the flies begin to pester him. Some blow the meat, others swarm into the sugar-basin (of milk the festive board is quite innocent), tumble into the tea, fly into his eyes, and not unfrequently into his mouth and throat, almost choking him, and thereby teaching the wisdom of keeping the mouth shut in a strange land. They torment him in every conceivable way during his walk to work through the bush, and until he dives into the depths of his hole, where—as the common sort do not venture far below the surface and confine themselves to vigorous attempts to effect a rapid descent of the digger by making him lose his hold of the sides or the rope—he hopes for a little peace: vain hope! deluded digger! A race of demons has lately sprung up in the shape of black flies, an inch in length, which buzz around him in the shades below, and sting or bite most confoundedly, even to the drawing of blood; and he may possibly find, if the hole be damp, a snake or two coiled up snugly in a corner; a circumstance which occurred only about a week ago. As the digger generally works at some distance from his tent, to save time he takes his lunch or dinner with him, and about mid-day “knocks off” to find a spot where, “*recubans sub tegmine*” gum-tree, he may enjoy it, but the deuce a bit of shade do the trees afford from the rays of the sun, the leaves are all vertical! However, he sits down, taking care not to do so on a nest of lively young scorpions, and his old enemies the flies are at him again. Presently the ants, red and black, come out to investigate his proceedings, staring at him with their big saucer-like eyes, in a way to make a timid man feel rather nervous. These beauties vary in size, from half-an-inch to an inch and a quarter in length, and are armed with formidable jaws, and a sting far worse than any wasp it has been my fortune to become acquainted with. I am no draughtsman; but, as well as my pen will take it, I send a portrait of an individual

* Our readers will be grieved to hear that that most estimable naturalist Mr. Abel Ingpen (who communicated these amusing extracts from the letters of his son) died of cholera, on the 14th inst.

of the black species called or known here as the *bull-dog ant.** Well, the digger, after his day's work is over, goes home expecting to enjoy a comfortable evening after the annoyances of the day, and, supper over, composes himself with a soothing pipe. But this is just the time when the mosquitoes are getting lively, and the poor devil is at last driven to the recesses of his tent and blankets, where he thinks he may reasonably hope for a little rest, provided no attempt is made to stick him up by bushrangers, for whose benefit he takes care to lay his revolver under his pillow. Here again he is disappointed. There is a small insect, which in England sometimes haunts what should be the couch of repose, and those are happiest who have least acquaintance with it. The same murderers of sleep exist here, greater in size as might be expected, the climate being so favourable to animal life, but come not in single files or in battalions, but by *whole armies*! The poor exhausted digger wages war with these blood-thirsty miscreants, until, weary with toil and faint from loss of blood, he sinks into a troubled slumber. Presently a strange dog appears on the Diggins. This fact is at once noticed by some resident canine attached to a tent (every tent almost has its dog), the alarm is given, and soon the whole "flat" resounds with the most awful barkings and yellings which the canine throat and lungs are capable of producing. Roused by the noise, the digger, apostrophising the animals in no measured terms, waits, as patiently as he can be expected to do under the circumstances, until it subsides, and then sinks on his pillow once more. Soon the tinkle of an old tin-kettle is heard, and a horse, to whose neck it is chained and padlocked, comes snorting and champing around the tent, cropping the grass, stumbling over the tent-ropes, and almost pulling it down. And thus the night passes; often diversified by the pranks of the mice, who nibble everything in the shape of eatables they can find, and seem to consider the recumbent a sort of play-ground for them to scamper over at their pleasure. This is really no exaggeration. These nuisances, and many more which I could detail, we have suffered and do suffer from, daily and nightly. For my part I have had enough of Zoology in general, and Entomology in particular, to serve me for my life. Any charm the latter once had for me is among the things that were.

January 23rd, 1853.—We have had heavy storms of rain and whirlwinds of dust—perfect sandstones, and the flies are enough to

* Mr. Smith, of the British Museum, has obligingly named this insect *Myrmecia pyriformis*; the red one, before alluded to, is *M. gulosa*.

drive any person with a small stock of patience mad ; I never suffered such annoyance from anything in my life. They get into the eyes, the nostrils and the mouth, and cling to the face with most villanous pertinacity, returning immediately after they are driven away. Meat is never safe from them : they will blow it if it be exposed but a few minutes, and they actually deposit the maggots living ; indeed, if a blow-fly is killed, you may take the living maggots from their bodies. Then there are the ants, which may be found of all sizes, from the size of a pin's point to an inch and a quarter in length, and they both bite and sting—I say nothing of the B-flats and F-sharps, as we have none of them fortunately, but you can't go into a shepherd's hut in the bush without making a very speedy acquaintance with them. Oh, those flies ! I have totally changed my opinion of my Uncle Toby. Instead of his being the benevolent Buffer I formerly innocently thought him, I can now see that he was a perfect misanthrope, a man actuated by the worst possible feelings towards his fellow-creatures for allowing the blue-bottle to escape. The only thing in which this country beats England is in the moonlight nights, which are certainly glorious, and I enjoy them the more from the cessation of the attacks of the flies. The mosquitoes I think nothing of ; they are not numerous, and evidently don't like me.

February 17th, 1853.—We come home from work about half-past five, dine and tea (it is but one meal), smoke our pipes and talk round the camp-fire or read, and then retire to roost, and, until lately, to sleep the sweetest sleep. That, alas ! is not the case now, for we have recently had an irruption of F-sharps, which continue to murder sleep most effectually. I thought the flies bad enough in all conscience, but their annoyance lasted only until the evening, while the other wretches annoy us day and night,—positively my left arm is, in *appearance*, like one of my dear mothers' currant dumplings. I am really ashamed to tell you, my dear father, that I have rather neglected the capture of insects (excepting always the F-sharp's, which, as Bacon says, "come home to one's business and bosoms"), but I have not done so altogether. Fred. W. was taking an insect from a tree the other day, when a man, who saw what he was about, exclaimed, "Lord ! I wouldn't touch one of them things for any money, you don't know what harm they may do you. There's a d—d thing here they calls a 'Triantelope,' haven't you ever seen it ? It is a big spider, and if it bites you it will either kill you or makes you very ill." I suppose by his "Triantelope," he meant the Tarentella, which is said to be found in this colony.

April 10th, 1853.—Our old enemies the fleas are as pertinacious as ever in their midnight attacks, and rob us of a great deal of valuable slumber. We make frequent onslaughts on to them; but although we kill them by scores (we have positively killed as many as sixty in a day) they seem to be as numerous as ever—I spare none—considering that

The flea that bites and takes to flight
May live to bite another night;
Whilst he that 'twixt my nails is slain
Will never come to bite again.

August 10th, 1853.—I am sorry I did not send you some specimens of the sand-flies, which were so annoying at Melbourne in November last. The truth is, I never thought about it, and, happily for my comfort, I have seen none since. Insects generally are very shy at present, and it is very seldom that I can find any, but I make prisoners of all I see.

January 8th, 1854.—The insect tribes are now all alive, deuce take them, and the flies and ants do the utmost in their power to fill the lunatic-asylums by driving persons mad with their annoyances. Anything like it I never endured in my life before, and could never have formed any conception of: they are at you from before sunrise until sunset, and then come the mosquitoes, though I don't care for them, as they never attack me—probably I don't agree with them,—I only wish the fleas were of the same opinion. The ants swarm everywhere. One little black species is especially annoying, for they get into one's clothes and sting most unmercifully, and are always getting mixed up with one's food, which, as they smell most abominably, is not exactly agreeable. I am become almost a vegetarian; I live principally upon bread and cheese, rice and stewed apricots, for it is impossible to keep meat good, even for a day. I have bought meat at night, which has been just killed and quite warm, and, taking all the care I could with it, have found it the next morning a crawling mass of maggots!—Ugh!

Remarkable Anecdote of the Hedgehog.—Although the hedgehog has lately occupied more than a customary portion of attention in the pages of the 'Zoologist,' perhaps one other remarkable anecdote respecting it may not be uninteresting. At the edge of dusk I have several times during the last month perceived an individual of this genus busily employed in hunting for food on the turf in my pleasure-ground, but this day I was much astonished to find him similarly employed in the full glare of the noontide sun. It appeared to apply its snout repeatedly to the roots of the grass; in search, I presume, of worms, but without success. At length it met with a dead shrew, which it seized with great avidity, and, as I had a good view of it from behind a tree, without the possibility of its seeing me, I watched its motions with great attention: it repeatedly opened its mouth and pressed the shrew between its teeth, but without lacerating the skin: having been thus engaged for above five minutes it left the shrew, and retired about two yards from it. I then examined the latter, and found it much crushed, yet no part of it devoured; but when I approached the hedgehog, to my great surprise, I found it stretched out upon the grass in an almost inanimate state, and, although it crawled a few yards further, it died within an hour after its adventure with the shrew. Whether this took place in consequence of any poisonous quality in the shrew, or whether from want of other sufficient food, I will not undertake to decide. I merely state the fact as it occurred; but I believe, that neither dogs nor cats will eat the shrew.—*Oswald Mosley, Bart.; Rolleston Hall, September 15th, 1854.*

Occurrence of the Short-toed Lark (Alauda brachydactyla) at Scilly.—I have received the following interesting communication from Mr. Jenkinson, since his notice of the capture of the glossy ibis at Scilly:—

“September 20th, 1854.

“The bird (*Alauda brachydactyla*) corresponds in general description with the account given in Yarrell: the two central tail-feathers are lighter than the rest (which are dark brown), being olive-brown, the same colour as the scapulars and tertials. Irides olive-brown. Bill brownish along the top of the upper mandible towards the point; the rest white, tinged with brown. Whole length 6 inches. Bill, from gape, rather over $\frac{1}{2}$ an inch. Wing, from carpal joint, $3\frac{1}{2}$ inches. Tarsus $\frac{1}{2}$ inch. Hind toe and claw together $\frac{1}{2}$ inch. Legs and toes pale brown. The bird was observed among some bents growing on the sand a few yards from the beach, and appeared rather wild, and attracted attention chiefly by uttering a note that was unusual, as well as by its general appearance.”

The bird was shot by Mr. Augustus Pechell, who has accompanied Mr. Jenkinson to the Scilly Islands.—*Edward Hearle Rodd; Penzance, September 23, 1854.*

Cuckoo's Eggs in Nest of Tree-Pipit.—Last May I found a tree-pipit's nest, containing five eggs, one of which was a cuckoo's. On finding the nest I had a strong suspicion that it was a tree-pipit's, not a meadow-pipit's. I removed all doubt on the subject by killing the bird from the nest. I mention this fact as neither Mr. Yarrell nor Mr. Hewitson include the tree-pipit among the birds in whose nest the cuckoo has been known to deposit its egg.—*E. C. Taylor; July 23, 1854.*

Occurrence of the Bee-eater in Essex.—A beautiful specimen of the bee-eater was shot in the garden of a mill close by the river's side, in the parish of Feeting, in this county (Essex), about Midsummer-day, which came into my possession, and is now at Mr. Harbour's, bird-stuffer, Reading, for preservation.—*Thos. Catchpool, jun. ; Colchester, 14th of 9th mo., 1854.*

Occurrence of the Glossy Ibis at Scilly.—I have just received information of the capture of the glossy ibis on Trescoe, one of the larger islands at Scilly. The bird was observed picking up food at the edge of a pool: it appeared to be very tame, and was made to rise with some difficulty: this appears to have proceeded from its great emaciation, the body being a mere bag of bones. My informant is John H. Jenkinson, Esq., who is on a visit to Mr. Smith, the Lord Proprietor of the Islands. He writes me that the plumage is immature, being that of a bird of the second year, the brown of the head and chin being streaked with white; upper parts of the plumage, including the tail, glossy greenish bronze, with faint purplish tints.—*Edward Hearle Rodd ; Penzance, September 19, 1854.*

Amphipeplia involuta.—This, although given as a species in the splendid work of Messrs. Forbes and Hanley, is mentioned as being probably only a permanently deformed variety of *A. glutinosa*, a suggestion which is very probable, as we know how extremely liable all the *Lymnæ* are to be affected in form by peculiarity of situation. This supposition, however, is strengthened by the fact of an *involute* specimen having occurred among the ordinary form of *A. glutinosa*. Out of about 500 specimens taken this autumn some few have a more truncated spire than usual, and one has this part literally turned inside outwards; for instead of any spire it has a *deep* umbilicus, with the upper part of the outer lip projecting high above it. This local and periodical species has now been found near Norwich three separate times within the last ten years, and each time in a different locality. It has also been limited to a very small space in the ditch or stream where it occurs. It would be very interesting to know if any of the Irish specimens have been transferred to any other locality, and, if so, whether the form has been retained; and also whether any great variation in the shape occurs among them in their native habitat, and whether they may be obtained in every successive year. If any of the correspondents of the 'Zoologist' can furnish me with examples of these, I should esteem it a very great favour.—*W. K. Bridgman ; 69, St. Giles Street, Norwich, September, 1854.*

On the want of some Systematic Record of the New Additions continuously made to our Entomological Fauna.—It must have struck many entomologists that, to be *au fait* with the present extent of our Entomological Fauna, one requires to have a distinct recollection of every scattered notice that has appeared of any novelty during the last ten or twenty years: this may not be a difficult matter for any one who has

been attending closely to the subject during the whole time, and on whom each fresh discovery made sufficient impression to prevent its easily slipping from his memory: but take the case of a young entomologist now first beginning the study, and who procured for his guidance the last systematic work on the subject; conceive either a young Coleopterist taking Stephens' 'Manual,' or a young Lepidopterist Humphreys and Westwood for an infallible guide;—not being acquainted with other entomologists he has no resource but to obtain his information from books. After doing his utmost thoroughly to understand the work he is studying, and to obtain a clear perception of many points which the writers never thoroughly understood, he falls in with some older entomologist, who recommends him to get the 'Zoologist' as a *sine qua non*. Only too happy to hear that there is an inexhaustible mine of information, he obtains this invaluable treasure and reads it patiently through, from "The Siberian Mammoth" to the "Things hoped for" of Mr. Scott. He takes notes of the various new discoveries, but soon finds that this is not a very simple matter, nearly one-half of them being, at a later page in the 'Zoologist,' either corrected with the simple assertion that the writer was entirely mistaken, or else the fact that a new species occurred is left undisturbed, but the name by which it was first announced was erroneous. Why should not an annual *resumé* of the new species found, and new observations made in Entomology, be a feasible scheme? The captures of novelties are still recorded month by month, as of old, in the 'Zoologist;' but, at the close of the year, could not a small independent duodecimo be compiled, in which all these new facts should be arranged systematically? With reference to the *TINEINA* it is fully my intention to supply this vacuum, and I am bold enough to think of adding thereto all the new discoveries in the other groups of Lepidoptera. Those who are disposed to welcome this small addition to our literary lumber will perhaps communicate to me, *before the end of October*, notices of any new species they may have met with; and if collectors of other orders—Coleoptera, Hymenoptera, &c.—would add their contributions also, the little book might appropriately be termed 'The Entomologist's Annual.'—*H. T. Stainton; Mountsfield, Lewisham, September 20, 1854.*

Capture of Catocala Frazini at Brighton.—On September 16th I was fortunate enough to have brought to me a specimen of *Catocala Fraxini*. It was taken on the previous day by a poor boy, on a scaffold-pole near Brunswick Square, in this town. He was playing with what he termed an "owlet," owing to which it is a little rubbed, but is nevertheless in very fair condition. It was in my possession before it was quite dead, through the kindness of Mr. Swaysland. — *John N. Winter; Sussex County Hospital, Brighton, September 19, 1854.*

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

September 4, 1854.—EDWARD NEWMAN, Esq., President, in the chair.

In the absence of the Secretaries, the Chairman appointed Mr. S. J. Wilkinson to act as Secretary for the evening.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—Papers and Proceedings of the Royal Society of Van Diemen's Land, Vol. ii., Part 2; by the Society. 'Fabricia Entomologica,' par H. Jekel, Part 1; by the Author. A paper entitled "On some Arctic Species of Calanidæ," by John Lubbock, Esq., F.Z.S. (from the 'Annals and Magazine of Natural History'); by the Author. 'Proceedings of the Royal Society,' Vol. vii., No. 5; by the Society. 'Journal of the Society of Arts' for August; by the Society. The 'Literary Gazette' for August; by the Editor. The 'Athenæum' for August; by the Editor. 'Resumen de las Actas de la Academia Real de Ciencias de Madrid, en el Año Académico, de 1847 a 1848;' Idem, 1848 a 1849; 'Estatutos de la Academia Real de Ciencias;' all by the Royal Academy of Sciences of Madrid. The 'Zoologist' for September; by the Editor. 'Insecta Maderensia; being an Account of the Insects of the Islands of the Madeira Group,' by T. Vernon Wollaston, M.A., F.L.S.; by the Author. 'Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin im Monat Juni, 1853,' by Dr. Schaum; 'Hemiptera and Orthoptera from Mozambique,' forming part of the work of Dr. Peters on that country, by Dr. Schaum; both presented by the Author.

Old Series of the Society's 'Transactions.'

It was announced to the Meeting that, by a resolution of the Council, at the end of the present year the stock of the old series of the Society's 'Transactions' would be made up into volumes; and this notice was given that the Members might avail themselves of the interval to complete their sets.

Trade Museum of the Society of Arts.

It was also announced that the Council had resolved to present to the "Trade Museum" now forming by the Society of Arts such duplicate specimens of insects as could be spared from the Society's collection, especially of those which are injurious or beneficial to man, and a certain selection had been made; but in order to make the gift as comprehensive as possible, the Council requested the co-operation of the Members, by their giving such further specimens from their own collections as they may think proper.

Exhibitions.

Mr. S. Stevens, on the part of Mr. Evans, of Darley Abbey, exhibited a specimen of a new British Noctua, of which several had recently been taken in North Wales. According to Herrich-Schäffer's figure and description, it appears to be the *Spælotis Valesiaca*, *And. & Boisd.*, but it does not agree with Freyer's figure of the species.

Mr. Stevens also exhibited six specimens of *Agrotis lunigera*, likewise examples of *Spælotis catalauea*, taken recently at the Isle of Wight. He also brought for exhibition a box of insects collected in the neighbourhood of Singapore by Mr. Wallace, which contained many new and interesting species both in Lepidoptera and Coleoptera: among the latter, the Longicorns were very beautiful, and bore much the larger proportion compared with the other families.

Mr. Bond brought for exhibition specimens of *Acidalia degeneraria* from the Isle of Portland; *Orthosia hyperborea* from Perthshire, observing that this species had

hitherto been unique in the cabinet of Mr. Douglas; *Noctua tenebrosa*, also from Perthshire; and a specimen of *Acosmetia caliginosa* from the New Forest.

Mr. Edward Sheppard exhibited a box of Coleopterous insects, captured in the New Forest at the end of July and beginning of August, containing *Phloiotrya rufipes*, *Platypus cylindricus*, *Elater sanguineus*, *Triplax ænea*, *Mycetocharus scapularis*, *Triphyllus bifasciatus*, *Salpingus ruficollis*, and many others.

Mr. Hudson exhibited a hermaphrodite *Polyommatus Alexis*, remarkable for having the right wings ♀ and the left ♂, contrary to what usually occurs in such cases.

Mr. F. Smith exhibited specimens of *Myrmica cespitum*, ♂, ♀ and workers, only the ♀ and workers being hitherto known; *Myrmica flavidula*; a new species; and both the sexes of the true *Bombus soroensis*, taken from the nest. All these specimens were captured by him at Shoebury, near Southend.

Mr. S. Stevens, on the part of Mr. Oxley, exhibited a collection of insects, chiefly Coleoptera and Lepidoptera, made by him in South Australia: it contained many interesting species, and among the Lepidoptera were some fine examples of the families Tortricina and Tineina, and some cases of a large species of *Psyche*, composed apparently of pieces of a rush about an inch long, placed longitudinally and firmly cemented together.

Mr. Curtis exhibited specimens of the curious *Acentropus Garnonsii* from Glanville's Wootton, including the apterous female; also a large mass of white and very elongated eggs, supposed by Mr. Curtis to have been laid by the specimen exhibited, as they were found near her. Mr. Curtis presented two males for the Society's cabinet.

Damage to White Mustard-Crops by Insects.

Mr. Westwood read the following letter relative to a species of beetle (*Phædon Betule*) which had done great mischief to the mustard-crops near Ely:—

“ Ely, August 29, 1854.

“ Sir,

“ The enclosed beetles are now ravaging the white mustard-crops in the Fens near Ely. They are so numerous that hundreds of thousands might be collected in a few minutes by shaking the stems over a newspaper. Having devoured the leaves, they then bark the stems and the seed-vessels (provincially called “coshes”). The effect of walking through the field where they are is very singular: as soon as the stem is jarred down they fall, and the noise so produced is like the rattling of shot or hail all around you. The crops appear to have approached maturity before they commenced their attack, otherwise they must have been wholly destroyed. As it is, the stems and seed-pods are stripped, and the seed becomes lean and of inferior quality. I have not heard the folks say they remember such a visitation before, although I apprehend the insect is a very common one.

“ Mixed with the larger insects was the common turnip beetle, in the proportion of about 1 in 100. I observed that the brown mustard (*Sinapis nigra*), scattered as a weed throughout the crop, was also eaten in the same manner; but another cruciferous plant, the *Erysimum cheiranthoides* (which by the way is a very common garden and corn weed about Ely), was untouched. Will you kindly state what the insect is, and if it has been known to do the like before?

“ Yours, &c.,

“ W. MARSHALL.”

Acarus on Hay.

Mr. Westwood then read the following letter:—

“Villiarstown, Cappoquin.

“Sir,

“Enclosed are some insects taken from the base of a newly made rick: they lie in a band of about 4 inches thick by 9 inches wide. The hay was off a reclaimed bog, after oats. There is also another rick close by, which is affected the same way. When first they appeared they were removed at once, but in one or two days after the rick was as bad as ever. I shall feel much obliged if you will let me know what they are, what should be done to the hay to get rid of them, and also whether it is bad for horses to be fed on such hay.

“I am, Sir, yours truly,

“A. E. NICHOL.”

Mr. Westwood exhibited a drawing of this *Acarus*, observing it was very similar to the common cheese-mite.

Habitat of Chelifer.

Mr. Westwood exhibited specimens of *Chelifer*, which had been found in great numbers in melon-frames and similar situations. Messrs. Walker and Curtis had likewise observed them frequently in such places, and the latter thought they fed upon minute insects.

Materials of Wasps' Nests.

The Secretary read the following letter from Mr. W. H. Watkeys, relative to wasps' nests, and specimens of the material alluded to were exhibited.

“Stroud, July 27.

“Sir,

“Seeing, in the report given in the ‘Gardener’s Chronicle’ of your meeting, that a discussion arose as to whether wasps use the scrapings of solid wood in the construction of their nests, allow me to give an account of a little personal observation on the subject. I have several times observed wasps on and near beds of the dried stalks of stinging-nettles and similar substances, but till last Saturday I had not proof that they were used in the construction of their nests: I was passing near a hedge in which were numbers of these stalks, and about ten or a dozen wasps were hard at work biting off nearly all the outside of the dried nettles, and, the nest being near, I watched their coming to and fro, which I think was evident proof of the fact maintained by your Society.

“I am, Sir, yours &c.,

“W. H. WATKEYS.”

Mr. F. Smith observed that wasps sometimes do use solid wood in the construction of their nests, for he once had a nest of *Vespa Norvegica* for some months in his room, the wasps going constantly to and fro, during which period he noticed them frequently scraping and gnawing the outsides of his store-boxes, which are of deal, for building material. His room being a very dry one, he is confident it was the wood they used and not fungus, which could not have been found in such a place under such circumstances.

Beetles in Seeds of the Brazilian Wax Palm.

The following letter, from Geo. F. Wilson, Esq., was read:—

“Price's Patent Candle Company, Belmont, Vauxhall, London,
“August 22, 1854.

“Sir,

“A short time back a friend brought us, from Ceara, some seeds of the *Copernicia Cerifera*,—the wax palm of the Brazils, which yields the Carnahuba wax. While looking at the seeds yesterday, I perceived three live beetles among them. As the seeds are probably the first that have come to this country, the beetles may possibly be rare.

“Your obedient servant,

“GEO. F. WILSON.

“The Secretary of the Entomological Society.”

Some of the seeds and the beetles above alluded to were exhibited: the latter proved to be *Caryoborus Bactris*, of the family *Bruchidæ*.—*S. J. W.*

TYNESIDE NATURALISTS' FIELD CLUB.

The Fifth Field Meeting, for the year, of this Society, was held at Alnwick, on Thursday, the 31st of August.

Only a small number of members assembled at the trysting-place, where they were met by Mr. G. Tate, who kindly conducted them over some of the many interesting places in Alnwick and its vicinity. The fine old church was first visited; its peculiarities of architecture and ornament admired.

Leaving its hallowed precincts, the party next visited the beautiful dairy-grounds of Her Grace the Duchess of Northumberland: here, as well as elsewhere throughout the grounds, the many-foliaged forest trees were most prominent objects, many of them, denizens of other climes, apparently flourishing as freely as if beneath their native skies.

Quitting this scene of enchanting loveliness, the Club proceeded to the Abbey-grounds; where, after examining that ancient building (which, like all of its class, lies in a beautiful well-sheltered situation), they proceeded up well-kept walks, by the borders of the river, and crossing which at the suspension-bridge were led onward by shaded paths to Hulne Abbey, with many a pause by the way, for examination or remark, as game, both great and small, winged its way or strolled across the path.

Refreshed by a little needful rest, most of the party returned to Alnwick, having arranged to look over the Duke's Egyptian Museum. An hour and a half spent pleasantly there brought the dinner, which was well served at the White Swan Inn.

After disposing of the usual loyal toasts, a notice was read of a rose-coloured pastor (*Pastor roseus*) having been shot at the Stelling, since the last meeting of the Club.

Mr. Bold read a description of a new Coleopterous insect (*Lathrobium carinatum*),

taken on the banks of Irthing and Devil's Water, mentioning also some additions made to the insect Fauna during the day's ramble.

Diversified topics whiled away the evening "right pleasantly," and when the parting hour came each member took his departure, thinking, perchance, as he went, on similar cheerful gatherings to come.—*T. J. B.*

SOCIETY OF BRITISH ENTOMOLOGISTS.

September 6, 1854.—Mr. HARDING, President, in the chair.

Mr. Oxley, who has recently returned from Australia, wished to exhibit some insects he had taken during his sojourn in that country, but as this was a Society for the advancement of British Entomology only, he did not know that he should be in order by so doing.

The President observed that it was quite correct: this was a Society formed for the advancement of British Entomology only, but there was no rule forbidding the exhibition of exotic insects on extraordinary occasions such as the present, and therefore Mr. Oxley was perfectly at liberty to show the insects he had brought with him.

Mr. Oxley then exhibited several boxes of butterflies, moths and beetles, with some cocoons and pupa-cases. He likewise made some very interesting remarks on the habits of several species.

Mr. Dalmon observed that the sight of such beautiful and remarkable forms was enough to stimulate the Members of the Society to extend their energies to the collecting of exotic as well as British species.

Mr. Miller and several other Members made remarks on the extraordinary number of *Vespa vulgaris* this season, and said that at some of the railway-stations there was quite a battle between the passengers and the insects, which was very amusing to see. It was remarked by some persons that they (the wasps) were always numerous in a plentiful plum-season.

The President observed that he did not know that the plums had anything to do with it, but he had heard the remark before.

The President then exhibited the following insects from the coast of Kent:—*Leucania littoralis* and *Luperina albicollis* (this was the first time, he believed, these insects had been taken on that coast), *Xylophasia sublustris*, *Spælotis cataleuca*, *Agrotis corticea* and *A. cursoria*, *Neuria Saponaria*, *Dianthæcia carpophaga*, *Eremobia ochroleuca*, *Heliothis marginata* and *H. dipsacea*, *Plusia orichalcea*, *Aspilates citraria*, *Coremia ligustraria*, *Acidalia Persecaria*, *Limandra emutaria*, *Odontia dentalis* (bred), *Spilodes sticticalis*, *Pionea margaritalis*, with others from the same place. He also exhibited some insects from Lytham, on the Lancashire coast: among these were *Epunda Lichenea*, alive, and some specimens of *Spælotis præcox*.

The President said he had seen a fine specimen of *Sphinx Galii*, taken near Kingsdown, Kent, by Mr. Thorne.

The President announced the following donation to the Society:—the third volume of '*Insecta Britannica*,' from the Author, H. T. Stainton, Esq. A vote of thanks was passed on the donor.—*J. T. N.*

Remarks on Mr. Frederick Smith's 'Catalogue of British Hymenoptera Aculeata.' By J. C. DALE, Esq., M.A., F.L.S., &c.

HAVING received several of the Catalogues of Insects of the British Museum, I intend sending you some remarks on them from time to time, and I will commence now with the 'Hymenoptera Aculeata,' by Mr. Smith, to whom I once sent three species, which he did not know in the Formicidæ! One he has described as *Myrmica simillima* which he commences with, and I have a species named by Mr. Curtis as *Formica emarginata*, *Ol.* (not mentioned by Mr. Smith), which is common in Portland, on sands, comes pretty near *F. flava*, *Lat.*, but appears to be distinct. I took two specimens of a *Myrmica* near Charmouth, July 8th, 1835, one of which I gave to Mr. Curtis, who named it *maculipes*;* it is the largest species in the genus that I have, and appears to have been winged, as something like the rudiments are left.

Myrmica cæspitum. I took one specimen on the Holyhead Mountain, and another in North Wales.

„ *domestica.* I had from Mr. Smith, and also from Exeter by Mr. Abraham.

Myrmecina Latreillii. I took one in Cranborne Chace, and a second at Charmouth.

Mutilla Ephippium. July 14th, 1835, I took a large male on Parley Heath, and a female in the Isle of Wight.

Myrmosa melanocephala and *Tengyria ichneumonides*, July 15th, at Lulworth and Charmouth.

Tiphia minuta. March, 1818, on laurels at Glanville's Wootton.

Sapyga 5-guttata. Blandford and Ambleside.

Ceropales maculata. One at Glanville's Wootton. In plenty at Parley.

Aporus bicolor. Male and female. On a sand-bank, Parley Heath.

„ *unicolor.* I took two specimens; one at Middlemarsh, June, 18th, 1835, one of which I gave to Mr. Thwaites. Mr. Smith does not record this as a species.

Spheg spinifex? Near Peterborough, according to Barbut.

Astata boops. Near Wareham and Stourton Caumdle.

Oxybelus nigro-æneus? Bourne Mouth, Hants.

* Vide Linn. Trans. vol. xxi. p. 216.

- Alyson lunicornis*. Male. Glanville's Wootton.
Eumenes coarctata. I bred one from Parley Heath.
Vespa crabro and *vulgaris*. Come to sugar on moonlight nights.
Halictus 4-cinctus. Portland; one only.
 " *prasinus*. Bourne Mouth, Hants (*not* Wales, as recorded).
Andrena hæmorrhoidalis. Between Dawlish and Teignmouth.
 " *analís*. June 17th, 1842, Holnest, Dorset.
 " *Coitana*. Parley and Killin, July 20th, 1825.
 " *Cetii*. On Scabious flowers by Moore's River, Hurne and Parley.
 " *distincta* and *nigriceps*, Parley and Bourne Mouth.
 " *Aprilina*. Glanville's Wootton, April and May, 1835 (*not* Bourne Mouth, as recorded).
 " *argentata*. Parley and Bourne Mouth.
Cilissa hæmorrhoidalis and *tricincta*. Parley Heath.
Dasypoda hirtipes. Muddiford, Hants.
Megachile Leachella. Portland and Bristol.
Nomada baccata. Ramsdown and Bourne Mouth.
 " *borealis* and *Roberjeotiana*. Parley Copse, Elsington Wood and gravel-pits, Holm Bushes, near Holnest, Dorset.
Cælixys 4-dentata. One at Glanville's Wootton; in plenty at Hurne, &c.
 " *rufescens*. On mud-wall, Stilton, Hunts.
 " *vectis*. Portland.
Saropoda vulpina. Male. Parley.
 " *furcata*. Male. Middlemarsh.
Apathus rupestris. Glanville's Wootton.
Bombus fragrans. Isle of Arran.
 " *Skrimshiranus*. Lulworth.
 " *subterraneus*. New Forest.
Cleptes semiaurata. Glanville's Wootton.
 " *nitidula*. Great Yarmouth.
Chrysis Ruddii. On rocks in Portland.
 " *ornatrix*. I saw one on a sand-bank in the New Forest.
 " *bidentata*. One at Glanville's Wootton; in plenty at Parley, &c.
 " *succincta*. West Hurne, Bourne Mouth and Lulworth.
 " *cyanea*. Rare at Glanville's Wootton.
 " *austriaca*. Glanville's Wootton.
 " *neglecta*. Portland.

- Hedychrum ardens*. Lulworth, Portland.
 „ n. s.? (allied to *æneum*). Blandford, and near
 Barnstable.
Elampus Panzeri, Portland Sands by Chesil Bank.
Chrysis austriaca. Glanville's Wootton, Powerstock, and Cam-
 bridge.

J. C. DALE.

Glanville's Wootton,
 June, 1854.

Researches on the Development of Viviparous Aphides.

By WALDO T. BURNETT, M.D.*

EVERY naturalist is aware of the remarkable phenomena connected with the viviparous reproduction of Aphides or plant-lice, for their singularity has led them to be recounted in works other than those of natural science, and, from the days of the earlier observers, they have been the theme of a kind of wonder-story in zoology and physiology.

I need not here go over the historical relations of this subject. The queer experiments and the amusing writings of the old entomologists are well known. The brief history of the general conditions of the development of these insects is as follows:—In the early autumn the colonies of plant-lice are composed of both male and female individuals; these pair, the males then die, and the females soon begin to deposit their eggs, after which they die also. Early in the ensuing spring, as soon as the sap begins to flow, these eggs are hatched, and the young lice immediately begin to pump up sap from the tender leaves and shoots, increase rapidly in size, and in a short time come to maturity. In this state it is found that the whole brood, without a single exception, consists solely of females, or rather, and more properly, of individuals which are capable of reproducing their kind. This reproduction takes place by a viviparous generation, there being formed in the individuals in question young lice, which, when capable of entering upon individual life, escape from their progenitor, and form a new and greatly increased colony. This second generation pursues the same course as the first, the individuals of which it is composed being, like those of the first, sexless, or at least without any trace of the male sex throughout. These same conditions

* Extracted from Silliman's Journal for January, 1854.

are then repeated, and so on almost indefinitely, experiments having shown that this power of reproduction under such circumstances may be exercised, according to Bonnet, at least through nine generations, while Duvau obtained thus eleven generations in seven months, his experiments being curtailed at this stage, not by a failure of the reproductive power, but by the approach of winter, which killed his specimens; and Kyber even observed that a colony of *Aphis Dianthi* which had been brought into a constantly heated room, continued to propagate for four years, in this manner, without the intervention of males, and even in this instance it remains to be proved how much longer these phenomena might have been continued.

The singularity of these results led to much incredulity as to their authenticity, and on this account the experiments were often and carefully repeated, and there can now be no doubt that the virgin *Aphis* reproduces her kind, a phenomenon which may be continued almost indefinitely, ending finally in the appearance of individuals of distinct male and female sex, which lay the foundation of new colonies in the manner just described.

The question arises, what interpretation is to be put upon these almost anomalous phenomena? Many explanations have been offered by various naturalists and physiologists, but most of them have been as unsatisfactory as they have been forced, and were admissible only by the acceptance in physiology of quite new features.

As the criticism I intend to offer upon some of these opinions will be better understood after the detail of my own researches, I will reserve their future notice until the concluding part of this paper.

My observations were made upon one of the largest species of *Aphis* with which I am acquainted, the *Aphis Caryæ* of Harris. While in Georgia this last spring, it was my good fortune that myriads of these destroyers appeared on a hickory which grew near the house in which I lived. The number of broods on this tree did not exceed three, for with the third series their numbers were so great that their source of subsistence failed, and they gradually disappeared from starvation. The individuals of each brood were, throughout, of the producing kind, no males having been found upon the closest search; they were all, moreover, winged; and those few that were seen without these appendages appear to have lost them by accident. I mention this fact especially, since it has been supposed by naturalists that the females were always wingless; and therefore that the winged individuals or the males appeared only in the autumn.

The first brood, upon their appearance from their winter hiding

places, were of mature size, and I found in them the developing germs of the second brood quite far advanced. On this account it was the embryology of the third series or brood alone that I was able to trace in these observations.

A few days after the appearance of these insects, the individuals of the second brood, (B) still within their parents (A), had reached two-thirds of their mature size. At this time the arches of the segments of the embryo had begun to close on the back, and the various external appendages of the insect to appear prominently; the alimentary canal had been more or less completely formed, although distinct abdominal organs of any kind belonging to the digestive system were not very prominent. At this period, and while the individuals of generation B are not only in the abdomen of their parent (A), but are also enclosed, each, in its primitive egg-like capsule,—at this time, I repeat, appear the first traces of the germs of the third brood (C).

These first traces consist of small egg-like bodies, arranged two, three or four in a row, and attached in the abdomen at the locality where the ovaries are situated in the oviparous forms of these animals.

These egg-like bodies consisted either of single nucleated cells, of $\frac{1}{1000}$ th of an inch in diameter, or a small number of such cells enclosed in a simple sac. These are the germs of the third generation: they increase with the development of the embryo in which they have been formed; and this increase of size takes place, not by a segmentation of the primitive cells, but by the endogenous formation of new cells. After this increase has gone on for a certain time, these egg-like bodies appear like little oval bags of cells; all these component cells being of the same size and shape, there being no cell which is larger and more prominent than the rest, and which could be comparable to a germinative vesicle. While these germs are thus constituted, the formation of new ones is continually taking place. This occurs by a kind of constriction-process of the first germs, one of their ends being pinched off, as it were, and in this way what was a single sac is changed into two which are attached in a moniliform manner. The new germ thus formed may consist of even a single cell only, as I have often seen, but it (the germ) soon attains a more uniform size by the endogenous formation of new cells within the sac by which it is enclosed. In this way the germs are multiplied to a considerable number, the nutritive material for their growth being apparently a fatty liquid with which they are bathed, contained in the

abdomen, and which is thence derived from the abdomen of the first parent.

When these germs have reached the size of $\frac{3}{16}$ th of an inch in diameter, there appears on each, near one end, a yellowish vitellus-looking mass or spot, which is composed of large yellowish cells, which in size and general aspect are different from those constituting the germ proper. This yellow mass increases *pari passu* with the germ, and at last lies like a cloud over and concealing one of its poles. I would also insist on the point that it does not extend itself gradually over the whole germ-mass, and is therefore quite unlike a true germinative vesicle or a proligerous disk. When the egg-like germs have attained the size of $\frac{1}{16}$ th of an inch, there distinctly appears the sketching or marking out of the future animal. This sketching consists at first of delicately marked retreating of the cells here and there, but which soon become more prominent from furrows, and at last the whole form of the embryo stands boldly out. As the whole idea and form of the insect is thus moulded out of a mass of cells, it is evident that the separate parts which then appear, such as the arches of the segments, the extremities and the oval apparatus, consist at first only of rows of simple cells. This point is here beautifully prominent, and nowhere have I observed finer illustrations of the cell-constitution of developing forms. The development thus proceeding, each part of the dermo-skeleton becomes more and more distinct, and the increase of size of the whole is attained by the constant development of new cells. During this time the yellow vitellus-looking mass, situated at one of the poles of the embryo, has not changed its place; it has increased somewhat in size, but otherwise appears the same. When the development has proceeded somewhat further, and the embryo is pretty well formed, the arches of the segments, which have hitherto remained gapingly open, appear to close together on the back, thereby enclosing this vitellus-looking mass within the abdominal cavity.

It is this same vitelloid mass thus enclosed that furnishes the nutritive material for the development of new germs, which would be those of the fourth brood or D: this development of germs here commences with the closing up of the abdominal cavity, and the same processes which we have just described are again repeated.

The details of the development subsequent to this point are like those of the development of ordinary insects, or of the Articulata in general; and although this ovoid germ has at no time the structural

peculiarities of a true ovum, such as a real vitellus, a germinative vesicle and germinative dot, yet, if we allow a little latitude in our comparison and regard the vitellus-looking mass as the *mucous*, and the germ-mass proper as the *serous* fold of the germinating tissue, as in true eggs,—if, I repeat, we can admit this comparison of parts, then the analogy of development between these germs and true eggs of insects may be traced in considerable detail.

This comparison I have been inclined to admit, at least in part, from the striking resemblance of these developing forms at certain stages, with the embryological forms of spiders as they have been figured by Herold, and as I have myself traced them. When in spiders, the serous fold of the germinating tissue has extended so as to cover two-thirds of the developing form, leaving the vitelline mass on the dorsal surface near one of the poles, the whole embryo quite resembles that of a developing *Aphis* just before the arches of the segments close up on the back.

With this view of the relative parts of the germ, the following would be the details of the development of the different systems, and in the noticing of which I shall follow Kolliker.

1. The germinating tissue consists of two parts; a serous and mucous fold.
2. The abdominal plates arise from the serous fold, sprout out towards the vitelloid mass, pass over it, and unite on the dorsal surface of the future animal; on the opposite side are formed plates which do not unite, but are formed into the hind legs.
3. The wings are lateral limbs.
4. The first traces of the abdominal column appear in the chain of abdominal muscles situated between the nerves and the intestinal canal.
5. The nervous system in all its parts arises from the serous fold, as well also as the organs of sense.
6. The mucous fold, or the vitellus-looking mass serves no purpose in the formation until the closing in of the visceral plates.
7. Thus enclosed in the abdominal cavity, it is not transformed directly into the intestinal canal, but simply furnishes the material from which the component cells of the said canal and its hepatic diverticula are formed. It also furnishes the material from which the new germs are formed, as already shown.

8. The heart is formed on the dorsal aspect between the mucous and serous folds. In this way the details of development closely correspond with those of the embryology of the other Articulata which I have studied; and the subject is all the more interesting, as the germ-masses from which such development occurs in no way and at no time structurally resemble true eggs.

When the embryo is ready to burst from its developing capsule and make its escape from the abdomen of its parent, it is about one-sixteenth of an inch in length, or more than eight times the size of the germ at the time when the first traces of development were seen. From this it is evident that, even admitting that these germ-masses are true eggs, the conditions of development are quite different from those of the truly viviparous animals; such as, for instance, in *Musca*, *Anthomyia*, *Sarcophaga*, *Tachina*, *Dexia*, *Miltogramma*, and others among Dipterous insects, or in the viviparous reptiles,—for in all these cases of ordinary viviparity, the egg is simply hatched in the body instead of out of it. The egg, moreover, is formed exactly in the same way as though it was to be deposited, and its vitellus contains all the nutritive material required for the development of the egg until the coming forth of the new individual. The abdomen of the mother serves only as a proper nidus or incubatory pouch for its full development. This is true of all the ovo-viviparous animals whatsoever. With the viviparous Aphides, on the contrary, the developing germ derives its nutritive material from the fatty liquid in which it is bathed, and which fills the abdomen of the parent. The conditions of development here, therefore, are more like those in Mammalia, and the whole animal may, in one sense, be regarded as an individualised uterus filled with germs; for the digestive canal, with its appendages, seems to serve only as a kind of laboratory for the conversion of the succulent fluids which the animal extracts from the tree on which it lives, into this fatty liquid from which the increase and development of the germs take place.

When the young animal has reached its full development as an embryo, it bursts from its encasement and appears to escape from the abdomen of its parent through a small opening (*porus genitalis*) situated just above the anus. In the species under consideration, it generally remains clinging on the back of the parent until its external parts are dry, and it is able to begin life for itself. Each parent here produces from eight to twelve individuals, and if this rapid increase is

continued undisturbed, through seven to nine broods, we cannot wonder at the countless numbers which appear from so few original individuals.

Such are the details of the embryological development of the so-called viviparous Aphides, as far as I have enjoyed opportunities for their study. We will now refer for a moment to the special points which have here been made out. In the first place it is evident that *the germs which develop these forms are not true eggs*. They have none of the structural characteristics of eggs, such as a vitellus, a germinative vesicle and dot; on the other hand, they are at first simple collections, in oval masses, of nucleated cells.

Then again, they receive no special fecundating power from the male, as is the necessary preliminary condition of all true eggs; and, furthermore, the appearance of the new individual is not preceded by the phenomena of segmentation, as also is the case with all true eggs. Therefore their primitive formation, their development, and the preparatory changes they undergo for the evolution of the new individual, are all different from those of real ova. Another point is, *these viviparous individuals have no proper ovaries and oviducts*. Distinct organs of this kind I have never been able to make out. The germs are situated in moniliform rows, like the successive joints of conifer-void plants, and are not enclosed in a special tube. These rows of germs commence each by a single germ-mass which sprouts from the inner surface of the animal, and which increases in length and in the number of its component parts from the successive formation of new germs by a constriction-process as already mentioned. Moreover, these rows of germs, which, at one period, closely resemble in general form the ovaries of some true insects, are not continuous with any uterine or other female organ, and therefore do not at all communicate directly with the external world. On the other hand, they are simply attached to the inner surface of the animal, and their component germs are detached into the abdominal cavity as fast as they are developed, and then escape outwards through a *porus genitalis*, exactly as is the case with the eggs of fishes. Here, then, comes the important question, What interpretation shall we put upon these reproductive parts—these moniliform rows of germs?

Ignoring all existing special theories relating to reproduction, the observing physiologist would be left no alternative but to regard them as *buds*, true gemmæ, which sprout from the inner surface of the Aphid, exactly like the buds from the external skin of a Polype.

Before proceeding to a discussion of the relations of this important

conclusion to which we have just arrived, it may be well to refer to the views of others upon the exact signification of these singular reproductive phenomena.

Those old entomologists, such as Bonnet, Réaumur, De Geer, &c. who were the first to observe, besides verifying beyond all doubt, these peculiar phenomena, all believe that each brood constitutes a separate generation and that the reproduction takes place by true ova, as in the common generative act of other insects. This wide deviation from the ordinary course of nature, as it seemed to them, they attempted to explain and reconcile by various theories. Thus Réaumur affirmed that these viviparous individuals were androgynous; and, in later times, Léon-Dufour, who knew too well the anatomical structures of insects to believe with Réaumur that they could be hermaphrodites, referred these phenomena to spontaneous or equivocal generation.

Morrem, who made somewhat extended researches on the anatomy of *Aphis Persicæ*, and especially of its generative organs, advanced the novel theory that these broods were developed in the body of the virgin parent, by a previously organized tissue becoming individualised and assuming an independent life, exactly as he believed to be the case with Entozoa. To each and all of these views it scarcely need be said that they would be wholly inadmissible, according to the present established doctrines of physiological science, even had we no directly controverting observations.

But there are other explanations or views which deserve more attention. The first of these is that advanced by Kirby and Spence. According to them, "One conjunction of the sexes suffices for the impregnation of all the females that in a succession of generations spring from that union." In support of the reasonableness of this hypothesis, they quote several instances which they regard as of analogous character; thus they say, in regard to the hive-bee, that "a single intercourse with the male fertilizes all the eggs that are laid for the space of two years."

In this connection should be mentioned the similar hypothesis advanced for a like purpose by Jourdan. According to him many *Lepidoptera* lay fertile eggs when completely isolated from the males; such are *Euprepia casta*, *Episema cæruleocephala*, *Gastropacha potatoria*, *G. Quercifolia* and *G. Pini*, *Sphinx Ligustri*, *Smerinthus Populi*, and *Bombyx Quercii*.

But all these cases have really no strict analogy with that of the Aphides in question; for there is not, as with these last, a succes-

sion of innately fertile individuals, but only females which are capable of producing several broods from a single coitus, or after having been long removed from the males, which may even then be dead. Late researches upon the minute anatomy of the generative organs of insects have furnished results by which these phenomena, seemingly strange at first, can be explained. All these insects which are thus capable of laying fecundated eggs again and again after the first impregnation have a *receptaculum seminis* connecting with the oviduct, in which the semen is deposited during coition, and where it may be preserved without losing its vitalizing power for several months. Thus, by this provision the males, having copulated with the females in the autumn, may immediately die, while these last, hybernating, produce in the spring fertile ova; and in the instance of the *Bombus americana* such a coition suffices for all the three broods which are produced the ensuing summer.

Another explanation of these curious phenomena, and which has attracted some attention, as well from its singularity as from the eminence of its propounder, is that of Owen, advanced in his Hunterian Lectures in 1843.

He affirms that the larval Aphides are productive, in virtue of the successive continuation from brood to brood, of a portion of the primitively fertilized germ, and which material product or leaven is not exhausted until nine to eleven generations. I will quote his own language.

"In the Aphides, the corresponding vitelline cells retain their share of the fecundating principle (which was diffused through the parent egg by the alternating, fissiparous, liquefactive and assimilative processes) in so potent a degree, that a certain growth and nutritive vigour in the insect suffice to set on foot in the ovarian nucleated cells a repetition of the fissiparous and assimilative process, by which they transform themselves in their turn into productive insects; and the fecundating force is not exhausted by such successive subdivision until a seventh, ninth or eleventh generation."

This same doctrine, the successive inheritance of a portion of the primary germ-mass from brood to brood, and by means of which the fertile germs are continued,—this doctrine, I say, is repeated in full in this author's work on Parthenogenesis, and I will here quote one sentence, not only in illustration of this, but to show how different his own observations on the development of these animals are from mine just described. He says, "One sees such portion of the germ-mass taken into the semitransparent body of the embryo Aphis, like the

remnant of the yolk in the chick. I at first thought it was about to be enclosed in the alimentary canal, but it was not so. As the embryo grows it assumes the position of the ovarium, and becomes divided into oval masses and enclosed by the filamentary extremities of the eight oviducts. Individual development is checked and arrested at the apterous larval condition. It is plain, therefore, that the essential condition of the development of another embryo in this larva is the retention of part of the progeny of the primary impregnated germ-cell."

This view of Owen, so ingeniously advanced, and which he has made subservient for the chief support of his new doctrine of Parthenogenesis, is indeed plausible, and seems at first satisfactory; but, as I hope to show, it will not bear analysis.

In the first place, it is evident that Owen does not recognise any physiological difference between a bud and an ovum: this is clear from what he remarks in the first quotation, but in his work on Parthenogenesis he has said so in as many words. "The growth by cell-multiplication producing a bud, instead of being altogether distinct from the growth by cell-multiplication in an egg, is essentially the same kind of growth or developmental process." Here is a fundamental error, which if not removed will obscure all our views of the physiology of reproduction. I have already insisted upon the necessity of this broad distinction between these two forms,—a necessity based not only upon differences of anatomical constitution, but also upon physiological signification. An *ovum* is the exclusive product of an individual of the female sex, and is always formed in a special organ called the ovary. It is the particular potential representative of the female, and has its ulterior development only from its conjunction with a corresponding element of the opposite or male sex; and Zoology presents no instance where there is development from eggs unless these conditions of the two sexes are fully carried out. A *bud*, on the other hand, is simply an offshoot from the form on which it rests, a portion of the animal capable of individual development. It sustains, therefore, no relations to sex, and, in truth, is widely separated in its ulterior signification from that cycle of processes conceived in a true oviparous reproduction. All physiologists who have carefully studied embryological and developmental processes must feel the correctness and importance of this distinction, which lies in realities and not in words. It is true that a bud and an ovum are composed each of the same elements,—simple nucleated cells; but in one these cells are simply in a mass, while in the other they have throughout

the animal kingdom, high or low, a definite and invariable arrangement. Then again as to the constitution of each and both being on the whole of nucleated cells, it may be said that it could hardly be conceived to be otherwise, for nucleated cells are the elementary components of all functional organized forms; and it may be added, moreover, that he knows little of the highest physiology who has not learned that widely different teleological significations may be concealed beneath isomorphic animal forms.

I have thus dwelt rather lengthily upon this point, because I think it is a vital one in our subject, and the possession of clear ideas thereon will be found singularly conducive to our correct appreciation of the whole class of anomalous phenomena under discussion. But we will revert to the subject of Owen's hypothesis.

As to the chief point in this hypothesis, the continuation of the primary germ-mass as a leaven, from brood to brood, it requires but little thought to perceive that it is physically impossible. I would first allude to Owen's statement, quoted above, that a portion of the germ-mass is taken into the abdomen of the embryo Aphis, and, as he thinks, assumes, without any change, the position of the ovarium. By this he refers, undoubtedly, to the vitellus-looking mass I have described in my observations, and according to which, also, it appeared to serve only as the nutritive material out of which the digestive organs and the germs are formed. Moreover, I feel quite sure that the germ-cells are new cells formed in the abdomen, and not those derived from the parent. But the point I wish to enforce is, that even admitting that individuals B may contain an *actual residue* of individuals A, it is clearly evident that this succession must stop with brood B; for these residual germ-cells which compose B in its earliest condition are lost in the developmental processes, and the germs of individuals C, which are found in B, are each, primarily, nucleated cells formed *de novo*, as I have observed, and above described. With these observed conditions of development, it is impossible for the individuals of the successive broods to inherit the original spermatogenic force in the continuation of the original cells.

The hypothesis of Owen, therefore, plausible and ingenious as it may seem, does not appear to me to accord either with observed facts or with the soundest physiology of the reproductive processes. I may here remark, also, that his doctrine of Parthenogenesis, based as it is upon the conditions of the hypothesis in question, cannot, as such, be sustained, for the same reasons, and all its phenomena would appear to find their solution either in Steenstrup's doctrine of "Alternation

of Generations," so called, or in the conditions of true gemmiparity, —admitting, provisionally, that Steenstrup's doctrine and gemmiparity include really different physiological conditions.

But the most important explanation advanced, and the last which I shall notice, is that offered by Steenstrup in his doctrine of the "Alternation of Generations," and of which it forms a chief support. The details of this peculiar doctrine of Steenstrup I need not here furnish; they are well known to all physiological anatomists. Its features, however, may be expressed in a formula-like manner. Individuals A produce true fecundated eggs, from which are hatched individuals B, which are unlike their parents in all zoological respects, but in which are developed spontaneously, and without any reference to sex, germs which ultimately become individuals like A, and so the cycle of development is completed. These intermediate individuals, B, Steenstrup has termed nurses (*Amnen*), and he regards them as distinct animals subservient for a special end; he therefore considers that B constitutes a real generation.

Instances of such phenomena are found in the lower orders of the animal kingdom — Polyyps, Acalephs and Worms; and late research has shown that they are more or less common throughout the whole of the Invertebrata.

The difference between alternation of generation and metamorphosis is too marked to require illustration: in the latter there is the same individual throughout, and the developmental processes, although concealed beneath different exteriors, are regular and normal; with the former, however, this chain of development is broken by one form being developed in another, this intermediate form serving as a stepping-stone for a higher and ulterior development. Another important point in this alternate reproduction is, that in each new change some real progress is made, the nursing-form being manifestly inferior to the individual to which it gives rise.

Steenstrup regards the Aphides as furnishing the most perfect examples known of nursing individuals, and, on the whole, as constituting typical illustrations of the doctrine he has advanced.

But if this doctrine implies conditions other than those which belong to true gemmiparity, it does not appear to me that it has any support in the phenomena in question of the Aphides. And although I am inclined to believe, as I shall soon show, that all these phenomena, essentially, may be of the same nature, yet there can be no doubt that the manifestations are here somewhat peculiar. With the Aphides there is real morphological progress made in each brood, for

the viviparous individuals are, zoologically, as perfect in every way as those which are oviparous, except in their want of true sexual generative organs. I have shown that, in the one species here described, they had well-developed wings like the true sexual individuals. Moreover, each brood, from the first to the last inclusive, is merely a repetition of the same. But these conditions are external and economical, and, instead of offering these prominent examples as evidence against the validity of Steenstrup's doctrine, I would rather present them as broadly indicating that, after all, this doctrine in question involves no conditions excepting those belonging to a modified form of gemmiparity. All the instances of Polyps, Acalephs, Worms, Insects, &c., would then be classed in the same category, and the variations in manifestation would belong rather to the economical relations of the animal than to any intrinsic difference of physiological process. Thus the *Distoma*-nurses, instead of being developed to a condition resembling at all their parent, remain persistent on a low form; and not only is their whole zoological character undeveloped, but they also experience morphological changes from the developmental process which immediately goes on within them. All this is in perfect keeping with their economy as animals, for the low order of their conditions of life does not necessitate a higher and more truly zoological form of these nurses from which are to be developed the true animals: were it otherwise, I cannot but believe that both the nurses and the grand nurse of *Distoma* would quite resemble the original animals. In the case of the Aphides, the economical conditions are different, and finally illustrate this point.

The Aphis-nurse, in virtue of its very typical structure as an insect, must live under higher conditions, and so its development, zoologically, proceeds to a corresponding point: this point is where it, as an insect and as an Aphis, can furnish the nutritive material for the development of its endogenous germs.

Herein, then, would appear to consist the prominent morphological differences observed in this category of phenomena, and I need not labour further to show that they are irrelevant of the primary essential conditions of these curious processes.

Such appears to me to be the highest, both physiological and zoological, interpretation that can be advanced for these phenomena which Steenstrup has so ingeniously collected and collated; and to advance the view that these intermediate individuals or nurses are not intrinsically and zoologically the same as their parents, but furnish examples of how dissimilar animals may arise from a common stock,

—to put forth this view, I say, is to advocate a doctrine in physiology as mischievous as it is deeply erroneous. I think, therefore, that the doctrine of Steenstrup may prove to be unfounded as far as it would involve, intrinsically, new phenomena in the processes of reproduction; and, as I have said on a preceding page, all its conditions may find their illustration and solution in the various phases of gemmiparity.

If, in this discussion of some of the highest relations of physiology, we have not wandered too far from our subject proper, which we have thereby sought to illustrate indirectly, we will revert to the thread of its discourse for a few concluding remarks.

The final question now is, what is the legitimate interpretation to be put upon the reproductive phenomena of the Aphides we have described? My answer to this has been anticipated in the foregoing remarks. I regard the whole as constituting only a rather anomalous form of gemmiparity. As already shown, the viviparous Aphides are sexless: they are not females, for they have no proper female organs, no ovaries and oviducts. These viviparous individuals, therefore, are simply gemmiparous, and the budding is here internal instead of external as in the Polyps and Acalephs; it moreover takes on some of the morphological peculiarities of oviparity; but all these dissimilar conditions are economical and extrinsic, and do not touch the intrinsic nature of the processes concerned therein.

Viewed in this way, the different broods of Aphides cannot be said to constitute as many true generations, any more than the different branches of a tree can be said to constitute as many trees; on the other hand, the whole suite, from the first to the last, constitute but a single true generation. I would insist upon this point as illustrative of the distinction to be drawn between *sexual* and *gemmiparous* reproduction. Morphologically they have, it is true, many points of close resemblance; but there is a grand physiological difference, the true perception of which is deeply connected with our highest appreciation of individual animal life. A true generation must be regarded as resulting only from the conjugation of two opposite sexes—from a sexual process in which the potential representations of two individuals are united for the elimination of one germ. This germ-power may be extended by gemmation or by fission, but it can be formed only by the act of generation, and its play of extension and prolongation by *budding* or by division must always be within a certain cycle, and this cycle is recommenced by the new act of the conjugation again of the sexes. In this way the dignity of the ovum as the primordium

of all true individuality is maintained; and the axiom of Harvey, *omne vivum ex ovo*, stands as golden in physiology. The buds may put on the dress and the forms of the ovum, but these resemblances are extrinsic, and in fact only an inheritance from their great predecessor.

These phenomena, thus interpreted, furnish an excellent key to many others which have long been regarded as anomalous in the history of development.

I refer here to the so-called hibernating eggs (*Wintereier*) which are found in many invertebrates. These I have not seen, but they have been carefully described by several very trustworthy observers. These so-called eggs consist of oval masses or cells invested with a capsule, but in which no germinative vesicle and dot have ever been seen. Structurally, therefore, they do not resemble eggs, and it is from their form and ulterior development only that they have received this name. Moreover, they sustain none of the usual relations of eggs to the sexual organs, and, as far as I am aware, no one has witnessed their development in the ovaries. These bodies have been observed in *Hydatina* and *Notommata* among the Infusoria; in *Lacinularia* among the Rotatoria; and in *Daphnia* among the Crustacea. In all these instances they hatch without the aid of the male, the existence of which sex was once doubted from its unfrequent appearance.

Now I regard these hibernating eggs as merely egg-like *buds* exactly corresponding to the germs of the viviparous Aphides. In other words, there are in the animals I have just mentioned certain individuals which reproduce by buds which are developed under rather anomalous conditions; and I will add, in conclusion, that I suspect that this gemmiparous mode of reproduction will be found to be far from uncommon among most of the Invertebrata, when our researches into the history of their development shall have been more widely extended.

P.S. Since the publication of this paper, I have enjoyed the opportunity of making this series of investigations more complete, by an examination of the terminal or last brood, which appears at the end of autumn.

This terminal brood has hitherto been considered, as far as I am aware, to be composed exclusively of males and females, or, in other words, of perfect insects of both sexes. I was surprised, therefore, on examining the internal organs of the non-winged individuals, to find that many of these last were not females proper, but simply the

ordinary gemmiparous form already described. Moreover, so great was the similarity of appearance between these two forms—true females and gemmiparous individuals—that they could be distinguished only by an examination of their internal genitalia. Among the proper females there were, besides those which were filled with eggs or had already deposited them, other individuals in which the ovaries were but feebly developed, or, at least, in which no mature eggs had been formed. An opportunity was thereby afforded me to examine the structural differences between the true ovaries and their *quasi* representatives, the bud-like processes. The true ovaries had their usual well-known structure, multilocular tubes containing nucleated cells, which are probably the undeveloped germs; the bud-like processes, on the other hand, consisted of a row of cell-masses, oval and connected by a kind of peduncle, as described in detail in the preceding paper. These wide differences have, more than ever, persuaded me of the morphological dissimilarity of these two kinds of reproducing parts in this animal. It seems to me, then, that the real intrinsic difference between an ovum and a bud lies as deep as the conditions of sex itself, notwithstanding the latter often has, as in the present case for instance, some of the morphological characteristics of the former.

The appearance of sexless gemmiparous individuals in the terminal brood would seem to indicate, moreover, that the conditions which determine the appearance of individuals, usually exclusively male and female, are not, perhaps, referable to the fact of this being the last brood, but rather to relations of warmth and nutrition. This view is rendered more probable by the fact of the variation in the number of broods between the first and last, observed in the same species in different years, ranging between seven, nine, eleven or more. Moreover, Kyber, as quoted already in the preceding paper, by nursing continually in a warm room a collection of *Aphis Dianthi*, keeping about them a summer temperature, succeeded in continuing uninterruptedly the series of sexless or gemmiparous individuals for four years. There are many other facts in insect life that indicate in like manner some direct relation between temperature and nutriment and definite sexual development. The subject is as important as it is interesting in physiology, and these very animals will perhaps subserve the successful study of the primary morphological conditions of sex.

On the Application of Cyanide of Potassium to Killing Insects for the Cabinet. By G. B. BUCKTON, Esq.

ALTHOUGH the subject of the following paper was recently introduced to the notice of the Natural History section of the British Association, possibly a few words on the same point may not prove unacceptable to the readers of the 'Zoologist.'

Notwithstanding the able manner in which Messrs. Kirby and Spence have answered the objections made by some against the collector, on the score of cruelty, a disinclination, to discuss the less pleasing, but necessary operation of the entomologist, of depriving of life those insects required for future examination, appears to have been felt, since few writers, and they very slightly, touch upon the subject. In the event of obtaining a large Lepidopterous insect (we will suppose it a Death's-head) and confining it under a tumbler, it is not perhaps obvious to all how the creature is best disposed of. A decent and effective plan is a desideratum, and such I beg to propose in the following remarks. Previously, however, to describing a simple apparatus which I have found to answer all requirements, and which is applicable to nearly all cases, I will say a few words upon a method that may be employed when circumstances prevent the adoption of a better.

All insects may be killed by exposing them to a moist atmosphere, at a high temperature. This condition is best obtained by confining them in what may be described as a hot water diving-bell.

A bell of thin and well-annealed glass is furnished within and at its summit with a strip of cork, upon which the insect may be pinned. In broad daylight this may often be readily accomplished, for then the Noctuidæ and other night-flying moths are asleep on dark palings and in other retired situations.

With a little address, a sharp-pointed needle may be thrust through the thorax of the insect to the support on which it stands, which treatment strangely appears to affect it so slightly as scarcely to cause it to lift its wings. Sometimes they will remain in this constrained position quietly until the time arrives for the flight of that particular species, at which period they become restless, and strive to escape; an immediate transfer of the insect and needle to the bell is, however, desirable. The apparatus is then placed mouth downwards in a basin of water, at or near its boiling point, when it will be found that the heat of the expanded air within the instrument produces

almost immediate suffocation. A head of sealing-wax should be fixed to the needle, to prevent the insect fluttering off the cork support into the water.

This plan answers well for all specimens bred in confinement or otherwise well placed for operation, but it is nearly useless in collecting Tortrices, Tineidæ, or other minute insects which require delicacy in handling.

From the fact, proved by experiment, that the vapour of hydrocyanic acid diffused through a bell jar is very deleterious to insects, and the consideration that there are many obvious objections to the common use of so volatile and deadly a poison, I have been led to search for a solid compound of cyanogen sufficiently powerful in its properties for such a purpose, yet more portable and less dangerous than the acid itself. These desiderata are to be found in cyanide of potassium, which has the peculiar advantage of being slowly decomposed by moisture (that of the atmosphere is sufficient) into hydrocyanic acid, ammonia, and other products.

The apparatus necessary is very simple, and consists of a wide-mouthed glass jar or bottle, fitted with a brass cup, having an aperture capable of being pretty accurately closed by a slide. The jar is furnished with a false bottom of cloth or blotting-paper, under which from twenty to thirty grains of the cyanide are placed in coarse powder. The blotting-paper serves to absorb any moisture which may arise from the deliquescent nature of the salt. After the lapse of a short time a poisonous atmosphere is produced, which may be retained with all its efficacy for several weeks, without the necessity of renewing the charge of cyanide. A small glass bell and card complete the instrument, which may be taken into the fields, and made to take the place of a collecting-box. A transfer of an insect from the net is easily effected, by capturing it first in the bell glass with assistance of the card. After placing the whole on the cap of the instrument, the card and slide are removed, when the insect drops through the aperture and is suffocated in a space of time varying from forty seconds to two minutes. The apparatus is then free for another operation.

I am aware that many of the advantages here described are to be found equally in the use of crushed laurel-leaves, the vapour of which contains pure hydrocyanic acid. The convenience of the new over the old plan may be thus stated. The fresh leaves are not always to be procured, and the bruised mass after a short time loses its poisonous property: the leaves cannot, therefore, be stored

for future use. On the other hand, the cyanide of potassium is retentive of its properties, inexpensive, and may be kept any length of time in stoppered bottles,—recommendations which will be appreciated by the foreign collector.

Little or no fluttering is observed during subjection to the vapour, and the insect may remain with advantage for some time under its action, as the muscles thus become supple and more manageable for setting.

A small phial for the pocket, furnished as above, will prove a great help to those studying the Micro-Lepidoptera, as by its means specimens may be obtained microscopically perfect.

The Hymenoptera and Diptera are peculiarly sensitive to this subtle poison. They generally begin to clean and plume their antennæ (perhaps an argument in favour of those who consider that the olfactory nerves are placed in those organs), intoxication then seizes the insects, they turn on their backs, and lastly a violent spasm affects the muscles of the wings, which vibrate very strongly immediately before death.

During the last summer the instrument has been in pretty constant use, and with the best results. I have met with but one failure in its operation, which exception is perhaps sufficiently interesting to notice.

The fecundated female of the Burnet moth (*Anthrocera Filipendulæ*) resists the poison in a remarkable manner. A specimen was placed in the apparatus in company with the black spectre-moth (*Mormo maura*). The last large insect was dead in rather less than two minutes, but the former was found to be comparatively lively after the expiration of fourteen hours. It is worthy of remark that during this exposure to the cyanide, oviposition did not take place, but commenced immediately after liberation, exhibiting perhaps a knowledge, on the part of the insect, that such an atmosphere would not conduce to the comfort of the larvæ when excluded from the eggs. Tenacity of life has been repeatedly remarked by others under similar conditions. Many insects will deposit their eggs long after the death, and even stiffening of both head and thorax. These are, doubtless, wise and providential arrangements for ensuring the perpetuation of species. It is, however, to be observed, that the poison is inert, though in a less marked degree, on the male Burnet moth.

An exceptional case to the action of hydrocyanic acid has been lately mentioned, relating to the frog, which, it is said, may be made

to swallow the poison by the spoonful, and without inconvenience. Singularly, a cup of tea is certain death to the same animal, from the theine it contains.

I have it, also, from good authority, that the monkey looks upon tobacco-leaf much in the same manner as we do cabbage; at least one individual has been known to eat cigars almost to any extent and to be very partial to them. This is, perhaps, more remarkable than the case of the frog, since the digestive organs of the monkey must more nearly represent those of the human subject, which are not well calculated for such a diet.

In conclusion, a suggestion is made, whether the vapour from cyanide of potassium may not be found efficacious in destroying both moth and larvæ, in cases of stuffed specimens of Natural History, furs, &c. Experiment proves the larva of *Tinea pellionella* to be incapable of resisting its action, a fact of some value, when we consider how much more difficult it is to destroy the insect in this than in the imago state, and that it will long oppose the action of camphor and other preservations.

It remains only to state, that the vapour capable of such effects on insect life contains such slight traces of hydrocyanic acid, that it has merely a faint and sickly odour, evanescent, and not likely to have a deleterious action on the operator, unless introduced into the lungs in large quantity.

G. B. BUCKTON.

October 7th, 1854.

Entomological Botany (with more especial reference to the Plants frequented by the Tineina). By H. T. STAINTON, Esq.

(Continued from page 4472).

Reseda lutea. Wild Mignonette.

Reseda luteola. Yellow-weed.

Both common, and, from their erect growth, rather conspicuous plants, occurring on chalky or limestone soils: *lutea* is the favourite food of *Pontia Daplidice*.

Helianthemum vulgare. Common Rock-rose.

This pretty yellow flower is a great ornament to many a dry hill-side, and is equally abundant on the chalk downs in the South and

on the slippery sides of Arthur's Seat. In April and July its leaves are mined by the reddish larva of *Laverna Staintoni*; in May the terminal joint is screwed up by the larva of *Gelechia sequax*. In June the leaves are mined by a Coleopterous larva, with the name of which I am unacquainted.

Helianthemum polifolium. White Mountain Sun-Cistus.

Near Torquay I have observed this plant, which, except in the white flowers, much resembles the preceding, but I was not so fortunate as to detect any larvæ on it. My stay there was limited to a few hours: perhaps some entomologist may make a longer sojourn there, and be more successful.

Viola odorata. Sweet Violet.

Viola canina. Dog Violet.

These are the principal food of several of our fritillaries,—*Argynnis Paphia*, *Aglaia*, *Selene* and *Euphrosyne*, and also the still-doubted-as-British *Dia*.

Viola tricolor. Heart's-ease.

Speyer gives this as the principal food-plant of *Argynnis Lathonia*, one of our rarest and one of our most elegant British butterflies, and he also cites *Spælotis præcox* as feeding on it: this larva, according to Ræsel, who figures it (vol. i. pl. 51), feeds in May. Of the larva of *Rusina tenebrosa*, Guénée remarks that it feeds on the low plants which remain green during the "winter, and especially on the species of *Viola*."

Polygala vulgaris. Common Milkwort.

This little plant, with its flowers of blue, pink or white, so common on dry pastures, is still unknown to us as the food-plant of any Lepidopterous insect; yet I cannot but think that this arises from our overlooking the plant on account of its insignificance.

Tamarix anglica. Tamarisk.

Common in many parts of the Southern coast, but not at present observed as harbouring any Lepidopterous larvæ. *Gelechia Tamari-ciella*, found by Herr Mann near Leghorn, and *Agdistes Tamaricis*, taken near Strasburg, both derive their names from this genus of plants, but whether appropriately so or not future observations must show.

Saponaria officinalis. Common Soapwort.

This plant, which grows in "roadsides and hedges, mostly near villages," I have never met with. It is fed upon by the larva of *Neuria Saponariæ*, which eats the leaves, not the seeds; the latter are eaten by the larva of *Dianthæcia Capsincola* (for a graphic description of the mode of feeding of the *Dianthæcia* larvæ, I must refer to Guenée's 'Histoire Naturelle des Noctuérites,' vol. ii. p. 17, the passage being too long to transcribe here, and no abstract would do it justice). The larva of *Gelechia Fischerella* feeds in the terminal shoots of this plant, in May, betraying its whereabouts by the contorted appearance it gives to the head of the plant. In September and October the larva of *Coleophora Saponariella* feeds on the leaves, in small, cylindrical, nearly straight cases: these larvæ hibernate nearly full fed, but feed a little in the months of May and June of the following year.

Silene nutans. Nottingham Catchfly.

Common in many parts of the country, on chalk and limestone. Of *Dianthæcia albimacula* there is still, I believe, only a single British specimen: bearing in mind what Guenée remarks of the habits of the larvæ of this genus, and the ease with which they may be found by lamp-light, his observation with reference to this species, "not rare wherever the *Silene nutans* grows, on which plant the larva feeds," is of considerable importance. Mr. Harpur Crewe has found the larva of *D. carpophaga* feeding on the seeds of this plant.

Silene Otites. Spanish Catchfly.

Occurs in sandy and gravelly fields, in the Eastern counties. It is on this plant that *Coleophora Otitæ* feeds in the larva state: it is probable that the larvæ feed on the seeds in the autumn (see Zeller in 'Linnæa Entomologica,' iv. 348), but it is certain that they feed on the under side of the lowermost leaves in the spring: the case is cylindrical, straight, and fully half an inch long. The entomologists of Norfolk and Cambridgeshire should seek for it.

Silene inflata. Bladder Campion.

Abundant on dry chalky and sandy banks, and well known as one of the flowers most attractive to moths. It is fed upon by the larva of *Neuria Saponariæ*; and the larvæ of *Dianthæcia Cucubali*, capsin-

cola and carpophaga feed on the seeds. I believe the larva of *Eupithecia venosata* also feeds upon the young seeds. The leaves are frequently mined by a Dipterous larva. The larva of *Luperina luteago* feeds in the stem and roots, in July and August.

Silene maritima. Sea Bladder-Campion.

From the masses in which this plant grows on our coasts, it seems extremely probable that several species of larvæ should feed on it. I have repeatedly searched on it at Dawlish, but, with the exception of the Dipterous larva already mentioned as feeding also on *S. inflata*, I have met with no larvæ whatever.

Lychnis Viscaria. Red German-Catchfly.

A rare plant in a wild state, growing on dry rocks, near Edinburgh and in other parts of Scotland. A double variety was formerly not uncommon in gardens, but has now become rather old-fashioned. It was in the terminal shoots of this plant that Mr. Logan met with the larva of a new species of *Gelechia* somewhat resembling *fraternella*, for which he proposes the name *Viscariella*.

Lychnis Flos-cuculi. Ragged Robin.

Very common in damp meadows: it is fed upon by the larvæ of *Dianthæcia Cucubali* and *conspersa*.

Lychnis vespertina. White Campion.

Lychnis diurna. Red Campion.

Neither plant is rare, and the latter in many places is excessively abundant: it grows very freely at Dawlish, where I have observed the leaves mined by some small Dipterous larva. Speyer enumerates, as feeding on these plants, the larvæ of *Euthemonia Plantaginis*, *Dianthæcia Cucubali*, *capsincola* and *compta*, *Camptogramma bilineata* and *Gelechia Moritzella*: this last we find, from Herr Moritz's observations in Treitschke (x. 3, 215), feeds gregariously on their flowers and seeds, at the end of June and beginning of July.

Spergula arvensis. Corn Spurrey.

A common plant in corn-fields, especially on a sandy soil, and readily recognised by its linear leaves and small purple flowers: it is extremely probable that it will be found to afford nourishment to some

Gelechia larva, but at present we are not acquainted with any which feeds upon it.

Alsine. Sandwort.

There are several species of this genus, but none are at present known as the food-plant of a *Lepidopterous larva*.

Stellaria media. Common Chickweed.

This little plant ornaments many a waste piece of ground, more especially during winter, with its mass of green foliage and small white flowers: in our climate it is a true evergreen, and probably on that account has been observed as harbouring very many of the polyphagous larvæ, several of which are enumerated by Speyer. Of the *Micro-Lepidopterous larvæ* the only one hitherto observed in it is *Gelechia fraternella*, which has sometimes been found concealed in the terminal shoots.

H. T. STANTON.

Mountsfield, Lewisham,
September, 1854.

(To be continued).

Note on the Honey Buzzard in Norfolk.—Another fine specimen of this bird, in nearly adult plumage, was killed at Holkham about the 14th of September. A keeper, having observed a large bird rise from a bank near a wasp's nest, set a trap, and, returning soon after, secured the prize.—*H. Stevenson; Norwich, October 20, 1854.*

Occurrence of Rare Hawks near Blandford.—A magnificent adult male specimen of the honey buzzard (*Falco apivorus*) was brought me, on the 21st ultimo, by the gamekeeper of J. Oldham, Esq., of Kisworth, near here, where it was shot by him on the previous day: this is now the fourth occurrence of this bird in the neighbourhood; one killed at Grange, near Wareham, and now in the possession of the Rev. N. Bond, of Grange; one killed also near Wareham, by Mr. T. Dugdale, of that place, and, without much respect for Ornithology, given to his ferrets; and another killed also, in the same neighbourhood, by Mr. Bennett, of Wareham, and now in the possession of J. H. Calcraft, Esq., of Rempstone, in the Isle of Purbeck: this last was killed in 1852; the two former some years previously, but I do not know the exact date. A fine adult female of Montagu's harrier (*Falco cineraceus*) was also shot by Mr. Oldham's gamekeeper some time during this last summer, and is now in the possession of the Rev. T. House, of Anderson, near Blandford. Two beautiful specimens of the peregrine falcon have also been killed in this neighbourhood lately: one, here, a very old female, was trapped at the remains of a teal it had just struck down, and is now in my own possession; and the other, the finest old male I ever saw, was shot on Lord

Portman's property, at Bryanston, and is now in the possession of Mr. Shipp, of Blandford.—*Octavius Pickard-Cambridge; Bloxworth House, Blandford, October 6, 1854.*

P.S.—At this moment, as I have just finished writing, the keeper of Mr. Dray's decoy, on the heath between this and Wareham, has brought me in a beautiful old male peregrine falcon, trapped yesterday: this bird is so old as to have the throat and a good deal of the breast almost entirely without markings, which is, I believe, a sure sign of age.—*O. P.-C.*

Occurrence of Sylvia galactotes of Temminck on the South Downs, near Brighton, in Sussex.—As G. Swaysland, a bird-stuffer, of Cranbourne Street, West Street, Brighton, was driving on the South Downs, about six miles from Brighton, near a part of the Downs known as Plumpton Bosthill, he noticed a bird which he at first took for a cream-coloured variety of the nightingale. Having no gun he proceeded about four miles to obtain one, and, returning to the spot, found the bird about twenty yards from where he first observed it. It was very wary, flying always to the further side of some furze-bushes, and settling on the side furthest from him, mounting into the air some fifteen yards. Swaysland describes its flight as resembling that of the young of the red-backed shrike. He at last got a shot at about forty yards, and killed it: this was on the 16th of September last. The bird, on dissection, proved to be a male, and would shortly have moulted, one or two young feathers of the primaries having made their appearance on each wing: these are darker than the old ones. The feathers, also, on the back and tail, especially the central ones of the latter, are much worn. I borrowed the bird and sent it to Mr. Yarrell, who kindly sent me the following references, stating also that he was not aware of its having previously occurred in Britain:—The *Sylvia galactotes* is described in Temminck's *Man. d'Orn.* vol. i. p. 182, and figured in Werner's 'Illustrations of Temminck,' and by Gould in his 'Birds of Europe,' pl. 112, vol. ii. It is No. 146 on page 149 of Prince Bonaparte's 'Conspectus Avium Europæarum,' and is mentioned in Degland's 'Ornithologie Européenne,' vol. i. p. 367.—*William Borrer, jun.; Cowfold, Sussex, October, 1854.*

Occurrence of the Rose-coloured Pastor (Pastor roseus) in Derbyshire.—One of these rare and prettily marked birds was shot near the Holy Well, at the village of King's Newton, on the 16th of September. It was discovered by Mr. Peter Gregory, a market-gardener, whilst feeding on the ground, in a field much frequented by starlings, and where I observed one, as recorded in the 'Zoologist' (Zool. 2560), in 1842. It is evidently a young bird, and the rose colour is much more delicate than in the figure of the bird in Morris's 'British Birds.' It is now in my own possession.—*John Joseph Briggs; King's Newton, Swarkeston, Derbyshire, October, 1854.*

Poisonous Effects from Cherry-Stones.—A somewhat singular occurrence has lately come to my knowledge of the injurious effects to young pheasants occasioned by eating cherry-stones; but I will first mention the very serious consequences which some years ago befell a biped of my acquaintance, from the same cause. This young friend, who had come to London to see sights and amuse himself by visiting Richmond, Greenwich, and other neighbouring places of enjoyment frequented by the pent-up citizens of London, went one day up the Thames, in a boat, as far as Shepparton, a quiet and secluded spot, where anglers were much accustomed to resort in the summer months: on his way there this young gentleman had occasion to pass the several market-gardens bordering on the banks of the Thames, and well stocked with fruit

trees of almost every description, amongst which cherries and plums predominated: these were far too tempting to be overlooked by one of his age, and who had at all times an appetite many a quadruped might envy in vain; he accordingly put ashore, and bargained with the unfortunate owner of the garden to have three hours' run upon the fruit for eighteen-pence, which, according to average circumstances, would have been no such bad arrangement for the latter, if the former would have taken a reasonable proportion of gooseberries, currants, and other common fruit, but his mind was exclusively bent upon the full and luscious-looking cherries, and on these he fell with a will. Whether he occupied the whole of the three hours I am ignorant, but it turned out in the end that the young man had economized his time as much as possible by eating the stones as well as the fruit: the consequence was a most severe constipation and inflammatory attack, which required the attendance of a physician in the neighbourhood, and that I should be sent for from London, as the young gentleman's recovery was thought to be almost hopeless: however, after two days and nights of excruciating pain he was so far relieved as to be able to be removed back to London, but it was a considerable time before he looked with a favourable eye on a cherry again: the report of the physician, who was most kind and attentive, was, that he had never met with a similar case of voracity, and that he conscientiously believed the quantity eaten, from subsequent appearances, must have fully equalled, at the very least, a bushel or a bushel and a half of cherries! A friend this season desired his keeper to place a coop, with a hen and a brood of young pheasants, at the end of his orchard, where various kinds of fruit trees offered them a hasty retreat; but after the young birds had been left there a few days, first one, then a second, and so on, were found lying dead near the coop, with no apparent outward injury to account for their deaths: at length, as all the brood seemed likely to follow a similar fate, the gentleman desired two or three of the dead pheasants to be opened, and, on doing so, their craws were found greatly distended and entirely full of cherry-stones, a cherry-tree being just inside the coop: the remainder of the brood were removed to a distant spot, and all thrived and did well. There can therefore, I think, be no doubt that the poisonous effects and indigestible nature of the cherry-stones must have caused the death of these young pheasants, though a full-grown pheasant might perhaps have taken but little harm from them, unless eaten in great quantities. My young friend's fate had very nearly been the same as that of the pheasants, but he happily escaped.—*W. H. Slaney; Hutton Hall, October 17, 1854.*

Occurrence of Schinz's Tringa, the Hawfinch and White-fronted Geese at Scilly.—Mr. Jenkinson writes me word that a specimen of the rare *Tringa Schinzii* was shot at St. Mary's, Scilly, last week; that a hawfinch was seen in Mr. Smith's gardens; and that several white-fronted wild geese were shot.—*Edward Hearle Rodd; Penzance, October 17, 1854.*

Occurrence of the Crane (Grus cinerea) in Sussex.—On the 19th of this month I saw, at the Museum at Chichester, a specimen of the crane, which had been shot the day before at Pagham. It was in good condition, and apparently an immature female, the elongated plumes on the sides consisting of only two or three feathers, and the head and neck being much tinged with rusty brown. This was after a moderate gale from the west.—*Wm. Borrer, jun.; Cowfold, Horsham, Sussex, October, 1854.*

Occurrence of Richardson's Skua (Lestris richardsonii) at Lynn.—A young specimen of this bird was shot the other day in the estuary of our river, the Ouse. It measured, from the tip of the bill to the tip of the longest feather in the tail, 17 inches;

extent of wings, 37 inches; from flexure joint to the end of longest primary, $11\frac{1}{2}$ inches; beak, 1 inch; gape, 2 inches; tarsus, $1\frac{1}{8}$ inch; longest toe, $1\frac{1}{8}$ inch; claw, $\frac{1}{8}$ inch. The plumage as follows: bill lead-colour; nail black; head dark brown, feathers edged with wood-brown; back of neck buff-brown; back umber-brown, feathers edged with lighter brown; tertials and secondaries umber-brown, tipped with light brown; in some of the feathers the tips are nearly white; primaries, outer web black, the tip half brownish black tipped with light brown, the basal half white and shafts white; tail-coverts umber-brown, broadly margined with clove-brown; tail-feathers, part brownish black, the basal half white, two middle feathers about half an inch longer than the side ones; throat light brown, with longitudinal marks of dark brown; breast buff-brown, with transverse bars of darker brown; under tail-coverts clove-brown, with two bars of umber-brown on each feather; tarsus lead-colour, the base of the toes tinged with flesh-colour, the rest of the toes and web black. The pomarine skua much resembles this when in the same immature plumage, but the specific differences are in the measurements, the pomarine being larger, and the tips of the primaries in Richardson's skua being light brown.—*Edward L. King; Lynn, Norfolk, October 5, 1854.*

Occurrence of the Pomarine Skua (Catarractes pomarinus) in Derbyshire.—An individual of this rather rare skua has recently been obtained in Derbyshire, and under somewhat curious circumstances. On September 23rd a strange bird was observed by Thomas Cox, Esq., near the village of Burnaston, in company with some rooks. The stranger was evidently wishful to form companionship with the gentlemen in sable, but the desire was not mutual, and consequently he was driven about by them with considerable violence, until he ultimately fell to the ground, and was picked up by Mr. Cox. The bird proved to be the pomarine skua. It has been most admirably preserved by Mr. Cook, Museum, Derby. It may be, perhaps, worthy of remark, that Mr. Cook has generally in his possession several of the rarer feathered tribes, and if any subscriber to the 'Zoologist' passes through Derby he will, I am sure, be happy to show them to him.—*John Joseph Briggs; King's Newton, Derbyshire, October, 1854.*

Appearance of a Fish supposed to be the Fox Shark (Carcharias vulpes) off Scarborough.—About the middle of September, being on a visit to Scarborough, I went out with five gentlemen, in a small boat, to fish for whittings. When a mile from shore, the boat was anchored and the sport commenced. In a short time the boatman at the helm became much alarmed, frequently exclaiming that he had seen a monster fish as long as the boat, and he wanted immediately to pull to shore. The matter was at first treated by the party as a ridiculous story which had been invented by the man to excite their curiosity. In a few minutes, however, up started the man upon his legs and exclaimed "There he is!" at the same time pointing towards the fish, which had just risen to the surface of the sea. At that time the animal was about a hundred yards from the boat, and appeared at that distance about twelve or fourteen feet long. He afterwards came nearer, and he was estimated by the party at eighteen or twenty feet. His manners were somewhat curious and interesting. He would come up to

the surface of the sea, and lie with the upper part of his head back, from which a fin protruded (about two feet long), and the upper part of his singular tail out of water. After waiting perhaps a couple of minutes, a fish would catch his eye, and away he scudded after it with remarkable rapidity, leaving a track of white foam to mark the course which he had taken: then he was invisible for a few minutes; again appeared and exhibited the same actions. That he was not a specimen of the common shark or any of the larger common marine fishes (most of which I had seen) I felt certain, and, after a minute search in Yarrell's 'British Fishes,' I discovered that he resembled only one figure, viz., that of the fox shark, and I have no doubt that he was a specimen of this rare and singular fish. On the Scarborough coast herrings were unusually numerous about that period, and probably he was induced to venture so near the shore in pursuit of this his favourite food. Our boatman had been a fisherman from his youth, and had taken some curious fishes, but he had never seen a similar fish in any of his voyages. Mr. Yarrell, upon the authority of Mr. Couch, says, "It is not uncommon for one of these animals to approach a herd of dolphins that may be sporting in unsuspecting security, and by one splash of his tail on the water put them all to flight, like so many hares before a hound." It appears, from that author's account, that very few have been seen or taken off the shores of this country.—*John Joseph Briggs; King's Newton, Derbyshire, October 6, 1854.*

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

October 2, 1854.—EDWARD NEWMAN, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—*'Mémoires Couronnés et Mémoires des Savants Etrangers,'* tome xxv.; *'Bulletins de l'Académie Royale des Sciences et des Beaux Arts de Belgique,'* tome xx. 3me partie, tome xxi. 1re partie; *'Annexe aux Bulletins,'* 1853—1854; *'Annuaire de l'Académie Royale des Sciences, des Lettres et des Beaux Arts de Belgique,'* 1854; all presented by the Academy. Zuchold's *'Bibliotheca Historico-Naturalis, Vierter Jahrgang, 1 Heft. January to June, 1854;'* by the Author. Guérin's *'Revue et Magasin de Zoologie,'* 1854, No. 8; by the Editor. *'Proceedings of the Royal Society,'* vol. vii. No. 6; by the Society. The *'Literary Gazette'* for September; by the Editor. The *'Athenæum'* for September; by the Editor. The *'Journal of the Society of Arts'* for September; by the Society. The *'Zoologist'* for October; by the Editor. *'Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie,'* tomes iv. and v.; by la Société Impériale d'Agriculture &c. de Lyon. *'Mémoires de l'Académie Impériale des Sciences, Belles-Lettres et Arts de Lyon;'* *'Classe des Lettres, nouvelle Série,'* tome 2me; by the Society. *'Annales de la Société Linnéenne de Lyon,'* nouvelle Série, tome 1re; by the Society. *'Opuscules Entomologiques,'* par E. Mulsant, cahiers 2, 3 and 4; by the Author. *'Mélanges Entomologiques,'* par B.

P. Perroud, 2me partie; by the Author. 'Die geographische Verbreitung der Europäischen Schmetterlinge in Anderen Welttheilen,' von G. Koch, Leipzig, 1854; by the Author. 'Käferfauna für Nord und Mitteldeutschland,' 3 and 4 Lieferung, von M. Bach, Coblenz, 1854. Specimens of *Formica cunicularia*, ♂ and ♀, *Myrmica ruginodia*, *M. scabrinodia*, *M. lævinodia*, *M. cæspitum* and *M. flavidula*; by Mr. F. Smith. A piece of larch wood, from an old post, showing marks of the mandibles of wasps in biting off particles for building materials; by W. H. Watkeys, Esq., Stroud.

Exhibitions.

Mr. Stevens exhibited the first known British specimen of *Goniodoma auroguttella* (a species beautifully figured and described by Fischer-von-Röslerstamm), lately taken by him while sweeping on the banks of the Yar, in the Isle of Wight; specimens of a new *Miana*, captured near Darlington; a variety of *Apatura Iris* and a hermaphrodite *Thecla Quercûs*, taken near Rochester; and a new species of *Eccoptogaster*, found by Mr. Weaver in birch stumps at Rannoch.

Mr. Foxcroft sent from Perthshire, for exhibition, the following Lepidoptera, recently taken there by him: — *Phibalapteryx lapidata*, *Depressaria ciniflonella*, *Leptogramma Scotana*, and *Cheimatobia autumnaria*.

Mr. Douglas exhibited a specimen of *Crambus Cassentiniellus*, taken by Mr. J. Hemmings on the downs near Brighton, remarking that it was not only a species new to Britain, but is only known to have been captured in Italy by Professor Zeller. He also exhibited a new *Nepticula*, bred by Mr. Weaver, in Scotland, from leaves of *Vaccinium Vitis-Idæa*, for which he proposed the name *N. Weaveri*; and a specimen of the scarce beetle *Dytiscus minutus*, found by himself, on the 17th of October, on the palings of Addington Park.

Mr. Stainton exhibited leaves of various plants, each kind containing larvæ of different species of *Nepticula*; also leaves of hawthorn, containing larvæ of the beetle *Ramphus pulicarius*.

Motion communicated to Seeds by Insects.

Mr. Westwood said that Sir William Hooker had sent him some seeds received from the West Coast of America, which had excited some curiosity by jumping about: this motion was caused by an insect-larva in each of the seeds, and after a further examination he hoped to communicate some more particulars, and to obtain the name of the plant producing the seeds. Among them he had found an *Ichneumon*, which was probably a parasite on the enclosed larvæ.

Mr. Janson doubted if larvæ, perfectly enclosed as these were said to be, could possibly give motion to the seeds; but the President said that Réaumur, as cited by Kirby and Spence, had recorded a similar instance, and Mr. Curtis said he had verified Réaumur's statement, the insects being larvæ of *Bruchi*.

Economy of Grapholitha corollana.

Mr. Douglas read the following translation of part of an article by Professor Zeller, in the 'Zeitschrift für Entomologie des Vereins für Schlesische Insekten-Kunde zu Breslau,' No. 23, 1852 (published in 1844), observing that the species was not unlikely to occur in England.

"*GRAPHOLITHA COROLLANA*, Hub. fig. 282.

"*Tortrix corollana*, Frölich, Tort. Wurtembergis, p. 91, 218.

"*Graphol. corollana*, Duponch. Cat. p. 306."

After some critical remarks on the species, he says,—

"According to Frölich this *Tortrix* flies on flowers in May and June, but my experience is entirely contrary to this statement. I might assert that this *Tortrix* does not frequent flowers at all: it generally flies but little, and therefore is so seldom met with. Near Berlin I once caught several specimens on the 9th of May, towards evening, on the trunks of moderately thick aspens, and two of them were paired. Afterwards, in Frankfort on the Oder, on the 17th of March, from branches of aspen, which also contained larvæ of *Saperda populnea*, and which I had placed in water in a window exposed to the sun, I reared a fine female, which sat upon the young aspen-leaves. I then thought the larva had lived in the buds, and sought therein accordingly, but found only one larva, which I carefully described, but from which I only bred *Penthina dealbana*. At Glogau, on the 11th of May, 1851, on a young aspen, I caught a male which thus early was somewhat injured, going to prove that the time of flight could not extend far into the second half of the month, that consequently the indication of 'June' has not much probability, and, as all the allied species appear only once a year, there is no reason to think there is a second brood of this. In the year 1852 I procured, from two Coleopterists of this place, branches of aspen, in which were *Saperda* larvæ. On examination of the knots on the branches I noticed, in a defective part, an empty pupa-case projecting from the wood, and it immediately occurred to me that it might very likely belong to *corollana*. I therefore next examined other injured branches, and when I saw some larva-excrement hanging out of one I became certain that the larva of *corollana* lived in the wood of aspens. Only one of these branches furnished me with a moth, a male, which came out in the morning of the 11th of May. The branch was, underneath a twig, somewhat knotty and decayed. I had cut into it, in April, just down to the cavity wherein the pupa lay, in a web of powdered wood, with the head upwards, very lively, and still quite yellow. I fastened the pieces of the branch together again, and looked at it from time to time, and thus observed how the pupa became coloured. As it had lain with its head within the wood, I feared that, as in consequence of my cutting into the wood it had fallen out, I had replaced it in an unfavorable position, but this fortunately did not appear to have been the case. I saw, on the 11th of May, the pupa had worked itself out through a decayed part hitherto unobserved by me, from which it was almost entirely suspended; it became thus all but exposed; still it could make use of the spines of the abdomen, by means of which it had doubtless burst through the place of its exit, which had been prepared beforehand by the larva. At first I could not find the moth, and on shaking the box it did not fly off. At last I saw it sitting on a small bit of the wood, with its wings in a convex, roof-shaped position. In consequence of my having disturbed it, in my endeavours to put it into a small glass, it became very lively in the sunshine. A second fine example of *corollana*, which came out with the *Saperda*, I afterwards received from Herr Capt. Quedenfeld, one of the above-mentioned Coleopterists.

"It appears to me, from the foregoing details, that this moth is not so scarce as hitherto supposed, and that it may be obtained by breeding. For this purpose both old and young lower branches of aspens should be examined in the winter and spring, attention being directed to those having the knots of *Saperda* larva, as both these

insects appear to stand in a certain sort of relation to each other. If the branches be put into water there will be no difficulty in the breeding; indeed the moth will be obtained earlier by the warmth of a room than it could be taken at large."

On Entomological difficulties.

Mr. Stainton read a paper entitled "On the difficulties experienced by Entomologists, as exemplified by recent experience with the Larvæ of the Genus *Elachista*."

Introduction of Bombyx Cynthia into Malta and Italy.

The Secretary, adverting to the mention of the subject at the March and June meetings of this Society, read, from the 'Journal of the Society of Arts,' July 14th, an account, transmitted by Col. Sir Wm. Reid, Governor of Malta, to the Duke of Newcastle, of the successful propagation and distribution in Italy of the larvæ of this moth.

"The following despatch and enclosures have been received through the Foreign Office:—

"Valetta, May 17, 1854.

"MY LORD DUKE—In my despatch dated 2nd February, 1854, I begged your Grace to inform the Society of Arts, Manufactures and Commerce, that through the very laudable efforts of Mr. Piddington, of Calcutta, with the aid of the directors of the Peninsular and Oriental Company (after many failures), I had received sound eggs of the Indian silkworm (*Bombyx Cynthia*), called by the natives 'Eria' or 'Arriudy,' and which feeds on the leaves of the castor-oil plant.

"These worms having passed through all their mutations in Malta in a healthy state, a second generation, from eggs laid here, are now hatching daily.

"I have also had the satisfaction of learning that cocoons sent from Malta to the Agricultural Society of Turin have produced moths. Eggs have also been sent to Rome, and I am preparing to send them to other places in Italy, where they have already been asked for.

"I am not sure whether the natives of India usually spin the silk of this worm or wind it, although it is said that by a weak solution of alkali they so far dissolve the gum as to be enabled to wind the silk. But we have not yet succeeded in doing so in Malta.

"I enclose, from a Malta newspaper, some account of the periods at which the first brood made their changes, and also, from the 'Piedmontese Official Gazette,' an account of their progress at Turin, both of which may be interesting to the Society of Arts.

"I also send for the Society of Arts a few old cocoons, left by the chrysalides on assuming the state of moths, in the hope that the Society may be able to find some means of dissolving the gum, by which the worm unites the silken threads.

"I have, &c.,

"(Signed) WILLIAM REID, Governor.

"His Grace the Duke of Newcastle, K.G."

*The Eria Silkworm of Assam.**

"Some time since, our contemporary the 'Mail' published the contents of a pamphlet consisting of extracts from the 'Journal of the Asiatic Society of Bengal' on the silkworms of Bengal. The idea of introducing into Malta one of the species, viz., the Eria, or *Phalæna Cynthia*, of Assam, was then already started; but it was still a question whether the very first step of the introduction could be successfully accomplished. It is now known that this difficulty has been overcome; that eggs have been brought, worms hatched, fed on the leaves of the castor-oil plant, have spun their silk shrouds, and gone through all the processes of their mysterious existence round to the egg again, in a room of the Palace of St. Antonio.

"The subjoined memorandum, which we are authorised to publish, states the different stages of this process, the dates and appearance of the changes, and, in short, all the leading phenomena of the case:—

"Through the laudable efforts of Mr. Piddington, of Calcutta, aided by the directors of the Peninsular and Oriental Steam Company, after many unsuccessful attempts, his Excellency the Governor has succeeded in obtaining sound eggs of the Assam silkworm, called in that country the Arrindy, Aria or Eria, and by naturalists the *Bombyx Cynthia* and also *Phalæna Cynthia*. These eggs, which arrived in Malta on the 2nd December, 1853, having been placed under the care of Dr. Frendo, M.D., at St. Antonio, produced upwards of 600 worms. The first which were hatched died apparently from cold. But after a fire was kept in the room, and the temperature at between 58° and 68° of Fahrenheit's thermometer, very few died, and latterly none. These worms were fed exclusively on the leaves of the castor-oil plant, the *Ricinus communis* of botanists.

"On the 18th January some were observed to change their colour, and became of a light yellow.

"On the 23rd January they underwent their second change; they then assumed a bluish green colour.

"On the 28th January they commenced to undergo their third change.

"On the 6th February they began the fourth mutation.

"On the 8th February the first cocoon was observed.

"On the 11th March fires in the room were left off.

"On the 16th March the worms were in the state of chrysalis.

"On the 12th April the first moth appeared, and

"On the 17th April they began to lay their eggs.

"By the 7th of the present month the greater part of the moths died, after depositing their eggs, the average duration of their lives having been about 14 days. Twelve cocoons weighed 4 drachms and 25 grains: the average weight of a cocoon according to this is 1-12th of a grain."

"We have just been informed (May 9) that some of the eggs are hatched this day.

"In addition we republish, extracted from the above pamphlet, all the portion of it relating to the Eria worm. It may be useful for those interested in the subject to

* From the 'Malta Times.'

compare the series of phenomena observed in Malta and in India, and to note any differences. It certainly is not unreasonable to anticipate much advantage from the 'Eria,' should the climate permit the establishment of this stranger among us. The Palma-Christi grows readily in Malta, and it will be seen from the statements of the pamphlet how great is the productive power of the worm, and how useful a manufacture can be derived from its produce, even under the disadvantage of its not being yet 'wound off.' The last sentence quoted from the pamphlet seems particularly worthy of attention. The Maltese, who have made so much of their cotton, will in any case be able to turn to good purpose the durable produce of the Eria worm, and should practical chemistry prove to have in store the solution of the problem, how to wind off the silk without breaking, a new and most profitable channel for exertion will have been opened to the patient and ingenious workers of these Islands."*

Silk Culture.†

"At last, after many unsuccessful trials, we have had the good fortune to see the chrysalides hatched in Turin. Our correspondents, persuaded that *will is power*, were not deterred from the task, but by renewed exertions and successive attempts, have succeeded in their object of importing from Bengal to Turin the precious silkworm of the Indies.

"Our colleague Signor S. Giseri, so skilful in the rearing of silkworms, charged especially by the Royal Academy of Agriculture, writes us the following:—"The cocoons delivered to us by you on the 19th of March last, were placed in a dark room, where the mean temperature was kept at 20 centigrammes. I began to despair when I saw a month pass without any result, as at an equal temperature the cocoons of our country take only from 12 to 15 days to bring forth the moth; still the state of the chrysalis was not yet hopeless. The new insects just now come to life are very fine, with large and full wings, of a tawny colour, and having yellow oblong spots. I have already two pairs, which came forth two days since, and three males, which came forth yesterday, and am impatiently waiting for the appearance of their mates. The delay above mentioned was, to say so, providential, as the nourishment of the future worms was not yet ready; the young plants of the *Ricinus* (*Palma-Christi*) being only as yet furnished with their hard primitive shoots, although we had planted the seeds during the previous winter. I trust now we shall be able to rear up this new insect, which with so much anxiety, perseverance and outlay, has been brought over alive to Piedmont.'

"In the meanwhile we have received the intelligence that the Governor of Malta has successfully brought up a brood of them at Valetta.

"Sir W. Reid informed us, in his last, that he hoped to overcome the difficulties of unwinding the silk from the new worms, by using water slightly alkaline, and, what is perhaps better, water with a small quantity of *soap*, as the soda might perchance weaken the silk, and also injure its spinning quality.

* The matter referred to by the editor of the 'Malta Times' has already been published in the 'Journal of the Society of Arts.' It will be found in the number for March 3rd of the present year, p. 263.

† Translated from the 'Piedmontese Official Gazette.'

"His Excellency Sir James Hudson, the English Minister in Turin, assures us that when at Rio Janeiro, two years ago, he had heard that a Lombard had come there for the purpose of attempting, on a large scale, the rearing of the Palma-Christi worm, as both this insect and the Palma-Christi thrive well in Brazil.

"Mr. Piddington writes us from Calcutta, on the 17th of March last:—'I have read with pleasure the various notices of the Bombyx Cynthia inserted in the 'Official Gazette' of Turin. I know that these silkworms thrive at Malta, although they have been somewhat affected by the cold. I have written to our common friend, the Governor of Malta, to inform him that the temperature of Assam varied from between 57° and 40° Fahrenheit, the temperature being 68° F. (20 centigrade, 16° R.), and that the north and north-east winds blowing there are very cold. The seed I have forwarded to him came from Bogorah (F), half-way between Calcutta and Assam, where the cold is very intense. There is a great quantity of ice in winter in the plains at Hoogly, distant about 25 miles north of Calcutta, by reason of the evaporation of water in porous and shallow pans. I have also brought up in the winter many of those silkworms (*une couvée de vers*), which I had not hitherto attempted, and I have seen many perish in the early stages of their existence, the formation of the cocoons retarded, and every insect beginning to spin whilst still very small. In this we must admire one of the laws of Providence, to which every animal, and especially such prolific insects, must conform, namely, that there are seasons in which, owing to the atmospheric changes, and for want of sufficient nourishment, the insects die in great quantities. Were it not so, the world would not be large enough to contain them. I also warned Sir Wm. Reid that perhaps our rooms are too light for these insects, the light being injurious to their eggs, as it is to the germination of plants. In its natural state, the Bombyx Cynthia lives under the shade of green foliage, a very scanty light penetrating into the miserable huts of our ryots (peasants of Bengal). It is also believed that too much light is injurious to the production of silk. I give you a hint of these ideas, without commenting on them, being persuaded that you will exert yourself in every way for the successful rearing of these valuable insects. Lastly, let us bear in mind that these poor little animals are the first of their kind which have crossed the ocean, and been installed in the splendid palaces of the Knights of Malta, and that if you have an idea of presenting them at Court *je ne reponds pas des suites*.'

"Our spirited Mr. Piddington finishes by begging us to send his kind compliments to Signor F. Berzonzi, at Boulogne-sur-Mer, to whom we owe the first idea of the attempt to enrich Italy, if possible, with the new silkworm of the Indies.

"The problem, then, for the naturalist seems solved. This insect can be transported to, and successfully reared in, latitudes differing so widely from those of Turin and Assam in Bengal. The common Ricinus (*Palma-Christi*), especial food of the Cynthia, takes well in Piedmont; and already the production of the seeds more than pays the cost of cultivation. In the Province of Nice, in the Island of Sardinia, and in the more southern countries of Italy, the Ricinus grows luxuriantly. The silk-growers will now try how far it will answer to couple the rearing of the silkworm of India with that of China. The first yields in its native land seven crops of cocoons in the year, and supplies us with a finer and more beautiful silk. Naturalists and silk-growers will soon have the opportunity of trying a mixture of the two breeds; meanwhile, the experiments now made give every man to expect that the most sanguine hopes of those interested in the cultivation of silk will ultimately be realised. Let us close these few lines addressed to our numerous correspondents with the observation recently made by the celebrated naturalist, Geoffroy de St. Hilaire, President of

the Paris Society of Zoological Acclimatation:—‘The number of the species of animals generally reckoned by the modern naturalists exceeds 140,000, the greatest part of which will be perhaps always useless to man; whilst up to the present time we have not been able to domesticate more than 43 species.’ How much, then, remains to be done, and why, for instance, should we not follow the example of the Canary Islands, which have already more than doubled the value of their rural products by the easy cultivation of cochineal, and attempt to introduce at once this valuable insect into the Province of Nice, or, at least, into the Island of Sardinia, where the *Cactry spantia* [*Cactus Opuntia*] thrives in abundance.

“G. F. BARUET.

“Turin, April 29th, 1854.”

Mr. Westwood said that Professor Solly had made several experiments on the cocoons sent by Dr. Templeton from Malta, and he believed he had discovered the much-desired method of unwinding the silk from the cocoon.—*J. W. D.*

SOCIETY OF BRITISH ENTOMOLOGISTS.

October 3, 1854.—Mr. HARDING, President, in the chair.

The President exhibited a specimen of *Lithosia muscerda* taken by Mr. Buxton, and also the following Lepidoptera taken by himself:—

Noctua hebraica (*N. glareosa* of Stephens) taken near Dartford: this insect is rare so far South, but is not uncommon in the North of England.

Xanthia croceago and *Hadena lutulenta*, taken in Darenth wood.

Opostega crepusculella, taken at Deal.

The President called the attention of the meeting to the food-plants of Lepidopterous larvæ: he had collected on the Kentish coast a great number of larvæ, belonging to the families of Tortrix and Tinea, feeding on a variety of plants: many of these he exhibited last season, and two of the insects bred from these proved to be new. Many species of insects feed on a single species of plant, while others were less particular, feeding on several species: on the present occasion, he (the President) would confine his observations to species of insects which fed on a single species of plant, but on a future occasion he would extend them to those which fed on several: he exhibited the following:—

Ebulea crocealis, its pupa and food-plant, *Inula dysenterica*.

Coleophora fuscidenella, its larva-case and food-plant, *Alnus glutinosus*.

Coleophora Troglodytella, its larva-case and food-plant, *Eupatoria cannabina*: this larva, when full fed, quits the plant on which it has been feeding, and attaches itself to any other in the vicinity, and there undergoes its metamorphosis: it is very subject to the attacks of an ichneumonideous parasite, the male of which is winged and the female apterous.

Pterophorus lithodactylus, its pupa-case and food-plant, *Inula dysenterica*.

Tortrix spectrana, its pupa and food-plant: the larvæ draw together the tops of the common reed (*Arundo phragmites*) and sometimes also the leaves of the horse-radish (*Cochlearia armoracia*).

Tortrix Viburnana: the larva of this species is very beautiful, the ground-colour being white with black spots: it feeds on *Chlora perfoliata*.

The President then exhibited the following Coleoptera:—

Nedys Echii, bred from the roots of *Echium vulgare*.

Lixus bicolor, bred from *Erodium maritimum*, found at Deal.

Leiodes cinnamomeus, found at Darenth wood.

Ectinus aterrimus; Deal.

Mr. Dalman exhibited specimens of *Hypochalcea ahenella*, taken at Deal, and a *Simaëthis*, new to science; the larva of this last was taken by Mr. Harding near Dover, feeding on the common pellitory (*Parietaria officinalis*). Mr. Stainton proposed to call this species *Simaëthis Parietana*, a name to which there could be no objection.

Mr. Millar exhibited specimens of *Hipparchus Papilionarius*, *Acronycta Ligustri*, &c.

The following gentlemen were proposed as members:—Mr. Henry Jobson, of Suffolk Street, Bow; Mr. Joseph Thorne, of Morpeth Street; and Mr. Thomas R. Oxley, of Blackfriars Road.—*J. T. N.*

NOTICES OF NEW BOOKS.

‘*The Annals and Magazine of Natural History.*’ Nos. 80, 81 and 82, dated August, September and October, 1854; *price 2s. 6d. each.*
London: Taylor & Francis, Red Lion Court, Fleet Street.

No. 80 contains the following papers:—

‘Researches on the Development of Viviparous Aphides.’ By Waldo I. Burnett, M.D., Boston. Extracted from Silliman’s ‘*American Journal*’ for January, 1854.

‘On the true position of the Canaliferous Structure in the Shell of Fossil Alveolina (D’Orbigny).’ By J. H. Carter, Esq.

‘Notice of some New Species of British Nudibranchiata.’ By Joshua Alder and Albany Hancock.

‘Notes on the Ornithology of Ceylon, collected during an Eight Years’ Residence in the Island.’ By Edgar Leopold Layard, F.Z.S., C.M.E.S., &c.

‘On some New Cretaceous Crustacea.’ By Frederick M’Coy, F.G.S., Hon. F.C.P.S., Professor of Natural Science in the University of Melbourne, &c.

‘On the *Aclis unica*, *Auct.*’ By William Clark, Esq.

‘On some Arctic Species of Calanidæ.’ By John Lubbock, Esq., F.Z.S.

‘Description of a New Genus and Species of British Curculionidæ.’ By T. Vernon Wollaston, M.A., F.L.S.

'On the Genus *Lycium*.' By John Miers, Esq., F.R.S., F.L.S., &c.

'Note on the supposed Antheridia of *Rhamnus*.' By J. S. Burdon Saunderson, M.D. (This paper forms part of the Transactions of the Botanical Society of Edinburgh.)

Proceedings of Societies:—Zoological—Botanical of Edinburgh.

Miscellaneous:—On the Embryogeny and Propagation of Intestinal Worms; by MM. Ercolani and Vella. On two New Species of South-American Birds; by Philip Lutley Sclater. Description of a New Species of Hyrax from Fernando Po; by Louis Fraser, H.M. Consul at Whidah.

The new curculionideous insect described by Mr. Wollaston is one of the *Cossonides* of Schönherr, yet it is so singularly formed, as respects its five-jointed funiculus, that it may be regarded as connecting these with the *Rhyncophorides*, in which a like number of joints occasionally obtains. Mr. Wollaston calls the insect *Pentarthrum Huttoni*: four specimens were extracted, by Mr. Hutton, from the hard and undecayed wood of a cherry-tree at Alphington, in the vicinity of Exeter, in November, 1853.

No. 81 contains the following papers:—

'On the Occurrence of "Cinchonaceous Glands" in *Galiaceæ*, and on the Relations of that Order to *Cinchonaceæ*.' By George Lawson, F.R.P.S., F.B.S.E., Demonstrator of Botany and Vegetable Histology to the University of Edinburgh. (This forms part of the Transactions of the Botanical Society of Edinburgh.)

'Miscellaneous Notes on the Fauna of Dacca, including Remarks made on the line of march from Barrackpore to that Station.' By Capt. Robert C. Tytler, of the 38th Regiment Bengal Native Light Infantry.

'A Reply to some Statements of Dr. Williams on the Controversy respecting the Branchial Currents in the *Lamellibranchiata*.' By Joshua Alder, Esq.

'On the Genus *Lycium*.' By John Miers, Esq., F.R.S., F.L.S., &c.

'Rejoinder to Professor Milne-Edwards and Mr. Bowerbank.' By Professor Sedgwick.

'Notice of a New Species of *Caulerpa*, By R. K. Greville, LL.D.

Bibliographical Notices:—'*Geodephaga Britannica*;' by J. F. Dawson. '*The Medals of Creation, &c.*;' by (the late) G. A. Mantell, F.R.S. '*Genera Plantarum Floræ Germanicæ iconibus et descriptionibus illustrata*;' auctore R. Caspary. '*The Microscope and its application to Clinical Medicine*;' by Lionel Beale, M.B.

'The Microscope, its History, Construction and Applications;' by Jabez Hogg, M.R.C.S.

Proceedings of Societies:—Royal—Zoological—Botanical of Edinburgh—Linnean.

Miscellaneous:—On the Development of *Cænurus cerebialis*; by Professor Van Beneden. On the Capture of *Thecacera pennigera*; by William Thompson. Note on *Athyrium rhæticum*; by S. O. Gray. On the Occurrence of the Larvæ of *Sarcophaga* in the Human Eye and Nose; by Dr. E. Grube; from the *Archive für Naturgeschichte*, xix. p. 282.

No. 82 contains the following papers:—

'On the Mechanism of Aquatic Respiration, and on the Structure of the Organs of Breathing in Invertebrate Animals.' By Thomas Williams, M.D. Lond.

'On the remains of a Gigantic Bird (*Lithornis Emuinus*) from the London Clay of Sheppey.' By Jas. Bowerbank, F.R.S., &c.

'Notes on the Ornithology of Ceylon, collected during an Eight Years' Residence in that Island.' By Edgar Leopold Layard, F.L.S., C.M.E.S., &c.

'On the Fertilization of Ferns.' By W. Hoffmeister.

'Upon a New Species of *Alpheus* discovered upon the Coast of Herm (Channel Islands).' By W. V. Guise, Esq., F.G.S.

'Descriptions of three New Species of British Actiniæ.' By Philip H. Gosse, A.L.S.

Bibliographical Notices:—The Ferns of Great Britain. Illustrated by John E. Sowerby. The Descriptions, Synonyms, &c., by C. Johnson.

Proceedings of Learned Societies:—Royal—Zoological—Linnean—Botanical of Edinburgh.

Miscellaneous:—On the *Cænurus cerebialis* of Sheep; by Dr. Kuchenmeister, from the '*Bulletin l'Acad. Royale de Belgique*,' 1854, p. 306. On the Occurrence of Zinc in the Vegetable Organism; by A. Braun, from Pogymdorff's '*Annalen*,' vol. xcii., p. 175. Notes on the Bovine Animals of the Malay Peninsula; by George Windsor Earl.

'*Shells and their Inhabitants. The Genera of Recent Mollusca arranged according to their Organization.*' By HENRY and ARTHUR ADAMS. London: Van Voorst. Part XV., dated August, and Part XVI., dated September, 1854. 28 pages of letter-press and 4 plates; price 2s. 6d. each. Demy 8vo. plain; 5s. Royal 8vo. coloured.

Part XV. contains the following genera:—Fissurellidæa, *D'Orbigny*; Macrochisma, *Swainson*; Pupillia, *Gray*; Cemoria, *Leach*; Rimula, *Defrance*; Emarginula, *Lamarck*; Scutus, *Montfort*; Dentalium, *Linnaeus*; Antalis, *Aldrovandus*; Tectura, *Audouin* and *Milne-Edwards*; Scurria, *Gray*; Helcion, *Montfort*; Scutellina, *Lepeta* and *Gadinia*, *Gray*; Patella, *Linnaeus*; Nacella, *Schumacher*; Lophyrus, *Poli*; Callochiton, *Gray*; Lepidopleurus, *Risso*; Leptochiton and Tonicia, *Gray*; Chiton, *Linnaeus*; Chætopleura, *Shuttleworth*; Onithochiton, Enoplochiton, Schizochiton, Mopalia, Katharina, Cryptochiton, Amicula and Plaxiphora, *Gray*; Lorica, *H. and A. Adams*; Cryptoconchus, *Blainville*; Acanthochites, *Risso*; and Cryptoplax, *Blainville*.

Part XVI. describes the following genera:—Actæon, *Montfort*; Buccinulus, *Plancus*; Aplustrum, *Schumacher*; Hydatina, *Schumacher*; Bullina, *Ferussac*; Cylichna, *Loven*; Utriculus, *Brown*; Diaphana, *Brown*; Tornatina, *A. Adams*; Volvula, *A. Adams*; Bulla, *Klein*; Haminea, *Leach*; Akera, *O. F. Muller*; Scaphander, *Montfort*; Atys, *Montfort*; Physema, *H. and A. Adams*; Smaragdinella, *A. Adams*; Cryptophthalmus, *Ehrenberg*; Philine, *Ascanias*; Phanerophthalmus, *A. Adams*; Chelidoneura, *A. Adams*; Aglaia, *Renier*; Posterobranchæa, *D'Orbigny*.

'*The Transactions of the Entomological Society of London.*' New Series. Vol. III., Part 2. Published November 1, 1854; 32 pp. Trans., 16 Proc., 4 plates; price 3s. 6d.

The papers in this part are as follow:—

'*Characters of undescribed Lucanidæ, collected in China, by R. Fortune, Esq.*' By W. Wilson Saunders, Esq., F.R.S., &c. (concluded).

'*Descriptions of Two Species of the Genus Hemerobius of Linnaeus,*
XII.

new to this Country, with Remarks on the Nomenclature of Coniopteryx and on Orthotænia, Buoliana, &c.' By John Curtis, Esq., F.L.S., &c.

'Supplemental Descriptions of Species of African, Asiatic and Australian Cetoniidæ.' By J. O. Westwood, Esq., F.L.S., &c.

'Notes on the Species of Amycterus and allied Genera, with Descriptions of some New Species.' By G. R. Waterhouse, Esq.
Journal of Proceedings.

Anecdote of a Terrier.—About three months since a friend of mine lost a favourite terrier dog, and, after some days' absence, supposed it had been stolen. Seventeen days from that of its being missed, some labourers at work in a field sat down on the bank to have their dinner, and soon had their attention drawn to a low moaning noise, which at last they discovered to issue from a rabbit's burrow: the poor dog was at once thought of; and eleven feet from the mouth of the hole, after much labour in digging, he was discovered wedged in: when taken out he could not stand, but by judicious management in feeding soon recovered.—*T. Catchpool, jun.; Colchester, September 14, 1854.*

Occurrence of Hoopoes in the Isle of Wight.—When in the Island in August last I saw hoopoes in several collections, and was told that they generally occur there in April. Two were killed at one shot by the gamekeeper at — Warren in April last.—*John Dutton; St. Peter's Place, Hammersmith, September 7, 1854.*

Occurrence of the Red-necked Phalarope near Penzance.—A specimen of this elegant little wader has at last turned up in our Land's End district, and I believe it is the first recorded instance of its occurrence in Cornwall. It is in winter plumage, or it is otherwise an immature bird: the back is very dark, and several of the feathers, especially the scapulars, are broadly margined with reddish yellow.—*Edward Hearle Rodd; Penzance, October 30, 1854.*

Capture of Deilephila Galii.—When out mothing, between Kingsdowne and Margaret's Bay, on the 22nd of July, about half-past nine, I took a female specimen of this rare Sphinx in first-rate condition: it is now in the possession of Mr. F. Bond.—*J. Thorne; Morpeth Street, Bethnal Green.*

Occurrence of Elachista triseriatella near Dublin.—It will interest the Microlepidopterists to hear that I took a fine specimen of the above species on some nettles at Howth, County Dublin, on the 1st of July, of the present year. This is, I believe, only the second instance of the occurrence of this beautiful little moth; the first specimen (on which the species was founded) having been taken on Durdham Downs, near Bristol.—*A. R. Hogen; Charlton, Dundrum, near Dublin, October 10, 1854.*

Note on Sirex Juvencus.—During the recent hot weather I have repeatedly observed several insects buzzing about some lilac trees, in the small plot of ground adjoining my place of business in the midst of the town. These making their appearance day after day, my curiosity was aroused, and two of them were captured, and turned out to be either *Sirex gigas* or some nearly allied species. I have no specimen or figure by me at present to identify them with, but my impression is that *S. gigas* has the body more elongated. The great dissimilarity in size, however (one being four times the size of the other), struck me as being remarkable, the sex being apparently the same in both specimens. Both are forwarded herewith, in order that the species may be correctly named. Most probably they have been imported with timber from Norway or some of the Baltic ports.—*G. Norman ; Hull, September 11, 1854.*

[The species is *Sirex Juvencus*: the discrepancy in size is not unusual.—*Ed.*]

Capture of Carabus intricatus in Devonshire.—I see in the last number of the 'Zoologist,' that Mr. Waterhouse stated that the Rev. Mr. Hore had taken, in the neighbourhood of Plymouth, four specimens of *Carabus intricatus*, a species which was looked upon as a doubtful native. As it is desirable to add all the testimony in favour of so beautiful an insect being indigenous to this country, I beg to say that Dr. Leach took it at Tavistock and Bickley Vale: a friend told me that a gentleman named Salton took one in Bickley Vale; and I have this summer found the thorax of two and the elytra of one also in Bickley Vale: of course mine is no capture, but shows they are natives.—*J. J. Reading ; 5, Union Street, Plymouth, September 26, 1854.*

Description of Lathrobium carinatum, an apparently undescribed British Coleopterous Insect.—Deep jet black, very glossy, sparingly clothed with griseous pubescence: head large, fully one-third wider than the thorax, orbicular, depressed closely and very distinctly punctured, with an impression a little before the vertex in front; labrum rufous, fringed with golden hair; mandibles long, curved, prominent, rufous, black on the outer edge and at the tip; antennæ elongate, as long or longer than the head and thorax together, graceful, rufous, the basal joint with a dusky annulation; palpi also rufous. Thorax narrow, elongate-oval, much depressed, coarsely punctulated, with a distinctly elevated central carina, which is exceedingly smooth and glossy. Scutellum obtusely triangular, punctulated. Elytra bright blood red, black for one-third the length at the base, distinctly punctulate, somewhat wider than the thorax, parallel, depressed, the suture elevated, with a stria on each side. Abdomen depressed, strongly margined, very finely punctured, the antepenultimate segment narrowly edged with white, the last sparsely covered by stout black diverging hairs; beneath finely punctured and pubescent, black. Legs elongate, black, the trochanters rufo-brunneous, the apices of the tibiæ and the tarsi rufous and covered with aureous pubescence. *Male*, with the fifth segment beneath sinuated, the sixth canaliculate. *Female*, with the penultimate segment beneath a little produced and rounded: length 3—3½ lines. This very distinct insect is certainly the most beautiful of its genus; the bright blood red of its elytra contrasting strongly with the shining black of its body; whilst the large orbicular head, narrow carinated thorax, elongate antennæ and legs give it quite the graceful appearance of a Stelidion. It would appear to be very rare, two specimens only having come beneath my notice; one, a male, I took amongst gravel, near the river Irthing, Cumberland, in June, 1847; the other, a fine female, was captured in a similar locality, on the Devil's Water, Northumberland, by

George Wailes, Esq., at the Club's field-meeting in May last.—*Thomas John Bold ; Angus' Court, Bigg Market, Newcastle-on-Tyne, August 29, 1854.*

On the Transformation of Heliothis Dipsacea.—A description of the larva of *Heliothis Dipsacea*, with a few remarks on the perfect insect and its transformations, may perhaps be useful as well as interesting to the entomological readers of the 'Zoologist,' since I am not aware that it has hitherto been correctly described by any author on British Lepidoptera: the description in Westwood and Humphreys' work appears certainly erroneous; there it is given as "red with the head ash-coloured and interrupted white lines on the body:" with regard to other authors I cannot at this moment speak with such certainty, since, not possessing, I am unable to refer to them, though I think it is not unreasonable to conclude that Westwood and Humphreys' being the latest *complete* work on the subject, it has followed the previous authors, except where direct acknowledgment is made of the discoveries and observations of other individuals. During the last week in July last some eggs were laid by a female of *H. Dipsacea*, captured by myself on the heath; these eggs I placed in a flower-pot planted with various plants, such as the three common species of heath, some grasses and broad-leaved plantain, covering the pot with gauze; within a week they were hatched, and, much to my annoyance, some escaped before I was aware of it, from the gauze being too coarse; however, having rectified this error, I am enabled, from those retained, to give the subjoined description, taken at the different periods of their growth:—The egg itself is very beautiful, being perfectly spherical, but small for the size of the moth, of a bright but not *deep* yellow, and the whole surface closely and obliquely ribbed, giving it the appearance of finely-watered silk. From the egg to the third moult—being then about two-thirds of an inch long, cylindrical and slender for the length—they are of a murky though semitransparent olive-green, each segment with about eight black dots, arranged in pairs, and the head clouded with a darker colour. After the third moult the permanent colours begin to appear, though they vary again slightly after the next; they are now dark oil or olive-green, striped longitudinally with pale green, two stripes on each side being broader than the rest—one just above the feet, and one between that and the centre of the back. Each segment retains the former black dots, which are now plainly tuberculate, and from each issues a small black spine; the head pale green, distinctly variegated with the deepest green, almost *black*; neck the same deep black-green, under side dark green with short spiny hairs, and feet black-green; anal segment variegated like the head. After the fourth and last moult the general distribution of the colours and markings is still the same, but the broad pale-green stripe above the feet is now, in most specimens, pure white, though in some tinged with yellow; above that is a broad pale green stripe, edged on the upper side with bright yellow and interrupted with black markings, corresponding with the segments and containing the spiracles, which are white or yellowish; these black markings issue from the stripe next above, which is in most cases black, in some deep green; above this is a narrower pure white or pale yellow stripe; the back is dark-green, paler between the segments, and with four or five slender yellowish longitudinal lines; all the stripes run throughout the whole length of the body, but these lines stop at the black nape of the neck. The under side is now pale green, the feet slightly rufous, and the head and anal segment as after the third moult. The black tubercles and spines do not appear to increase in size with the growth of the caterpillar, so that they are scarcely visible when it is full fed; the length when full grown is about an inch and a half to two inches, and they appear liable to little or no varia-

tion, except occasionally in the general depth of colouring. About seven weeks from being hatched they retired just beneath the surface of the earth, and changed to the pupa state: this change appears to be the most critical of all, for but one completed it, and this has since died, the rest dying at different stages of development. The pupa itself is about seven or eight lines long, the posterior extremity slightly elongated and furnished with a double, stiff, curved spine, and enclosed in a strong though not hard cocoon formed of silk and particles of mould. The failure in changing to the pupa state is the more vexing as their growth throughout the larva state was remarkably free and healthy. The perfect insect, from some cause or other, was very rare this year, inasmuch that in twelve days, working several hours each day, I obtained but six specimens; it did not, however, vary from its usual time of appearance. With regard to the food of this larva, though I have no doubt it is (here at least) solely heath, yet those I reared infinitely preferred the plantain, and the green, unripe seed-vessels in preference to the leaves; in fact, for the last month I fed them entirely on the seed-stems; they would also eat the common dock. When stretched motionless along a green shoot of heath they are almost indistinguishable, and, on whatever plant feeding, it would be difficult to detect them without an exceedingly close search, which may (together with its being thinly dispersed over a large tract of ground, thickly clothed with its food) account for its having hitherto been unobserved. Out of about ninety specimens of the perfect insect, containing about an equal proportion of both sexes, that I have myself captured within four years, not one before ever laid an egg; in fact, I think it may be correctly laid down as a general rule that the further the Noctuidæ are removed from the Bombycidæ in form and structure, the more infrequent are the instances of eggs being laid after capture; and probably a good entomological anatomist, if there be such among our collectors, would be able to give some structural reason for this, and on which some useful generic distinctions might be based. I fear that by this time many will have thought me needlessly prolix in the description of *one* species only, but in reading and comparing descriptions given by some authors with the subjects described, I have often thought that they might, with great propriety, say each to himself, "*brevis esse laboro, obscurus fio*;" and, at the risk of running into the opposite error, I have endeavoured to avoid this one. I have taken as accurate a coloured drawing as I am able of this larva, and as I hear that Messrs. Westwood and Humphreys are issuing a new edition of their beautiful work, I shall be too happy to place it at their service, if they should consider it of any use to them, and I take this opportunity of so doing through the medium of the pages of the '*Zoologist*.'—*Octavius Pickard-Cambridge; Bloxworth, Dorset, October 25, 1854.*

Notes on the Capture of some of the rarer British Hydrocantharidæ.

By the Rev. HAMLET CLARK, M.A.

IT is hardly matter for surprise that these groups of water-beetles, however interesting in themselves, have not received from entomologists that attention which has been bestowed upon the Geodephaga, Curculionidæ, &c.: their habitats require for their

capture a distinct and cumbersome apparatus; there appears among them but little variety of form; and the species known to be indigenous are few and often local: nevertheless, a study of their economy well rewards the naturalist; their habits and metamorphoses are as interesting as they are little known; while the assumed limited number of native species encourages the hope that an acquaintance with all is not impossible.

During the last two years I have paid some attention to these groups; and, with the object of inviting the attention of others, send you some memoranda respecting their localities and captures. I should state that the nomenclature I adopt is that of Dr. Schaum, at p. 1887 of your magazine.

Haliphus elevatus. Sparingly in the reservoir near Daventry.

„ *mucronatus*, *Steph.* Two specimens in Holme Fen, Huntingdonshire, 1853. This appears to be either a very local or a rare insect with us; though Dr. Aubé has taken it very abundantly in the neighbourhood of Compiègne.

„ *fulvus*, *Fab.* Not uncommon.

Chemidotus cæsus. Common in the neighbourhood of Whittlesea Mere in June.

Hydroporus decoratus, *Gyll.* I took a few specimens of this insect in Horning Fen, Norfolk, in a ditch densely covered with duck-weed.

„ *confluens*, *Fab.* Very sparingly at Holme Fen. I have never met with this species (common, according to Stephens) in any abundance.

„ *Davisii*, *Curt.* Near Norwich, in a small gravelly brook. May, 1854.

„ *assimilis*, *Payk.* In the utmost profusion in the lake near Kean's Cottage, Isle of Bute, September, 1854; also near Northampton, August, 1853.

„ *halensis*, *Fab.* Five specimens, as the result of three days' hard work, in a lake near Loch Spelvie, Isle of Mull, September, 1854.

„ *elegans*, *Ill.* A dark variety of this species common in the Isle of Bute, September 1854.

„ *parallelogrammus*, *Ahrens.* In profusion near Sheerness.

„ *9-lineatus*, *Rudd.* In lake near Kean's Cottage, Isle of Bute, September, 1854. Not common.

„ *vittula*, *Erichs.* Sparingly in the neighbourhood of Norwich, May, 1854.

Hydroporus nigrita, *Fab.* = *trivialis*, *Steph.* This species has been overlooked by Schaum, and is not included in his catalogue. I have taken it on several occasions in Norfolk in small road-side grassy puddles. Never in deeper ditches or pools.

„ *rufifrons*, *Dufst.* Whittlesea Mere.

„ *oblongus*, *Steph.* Of this rare and beautiful insect I took five examples in and about Horning, Norfolk, May, 1854.

„ *Gyllenhalii*, *Schiodte.* In the district of Whittlesea Mere, occasionally met with.

„ *tristis*, *Payk.* In abundance near Oban, Argyle, in peat-holes on the hills. I took what I believe to be a constant variety of this species in a lake by Achnacraig, Mull.

„ *angustatus*, *Sturm.* In profusion in Huntingdonshire: one specimen near Crinan, Argyle.

„ *obscurus*, *Sturm.* Plentifully in Argyle, near Connel Falls.

„ *umbrosus*, *Gyll.* This species is apparently very local. I took several specimens in boggy ground near Norwich, in a little swampy puddle of most uninviting aspect.

„ *granularis*, *Fab.* Not uncommon.

„ *geminus*, *Fab.* Common in shallow, muddy, fen ditches near Peterborough. This insect, like *assimilis*, *Payk.* seems to prefer open shallow water to the cover of weeds.

Besides the above, I have two or three species which cannot be referred to any known British species: one which I took near Oban, September, 1854, has been determined by Mr. Adam White and Dr. Power as *H. melanarius*, *Sturm.* of the European collection in the British Museum.

Agabus agilis, *Fab.* Among weeds and in grass-margined ditches in Norfolk: once in some abundance in Horning Fen.

„ *arcticus*, *Payk.* In a lake in Orogan, Isle of Mull, September, 1854. I took the insect only by wading, and brushing with my net a species of short grass that covered a small rock at the bottom of the lake, in three or four feet water.

„ *striolatus*, *Gyll.* This is an early spring insect: it may be distinguished from all other species by its very parallel sides. I took one specimen in Horning Fen, May, 1854. See note by Schaum, Zool. 1932.

Colymbetes notatus, *Fab.* This insect is certainly local, but when found not uncommon; Whittlesea Mere, 1853.

„ *bistriatus*, *Bergst.* In small pools on hills near Oban, and also in Mull, September, 1854.

Colymbetes Grapii. Near Norwich, not uncommon, and also more sparingly in the fens of Huntingdonshire.

Hydaticus transversalis, *Fab.* Common in deep weedy ditches throughout fens of Huntingdon and Ely.

„ *Hybneri*, *Fab.* More rarely met with; two specimens from ditches near Holme Station.

Dytiscus lapponicus, *Gyll.*, *Aubé*, *Germer*, &c. I have much pleasure in being able to add the above very distinct species to our British Fauna, having captured four specimens on four separate occasions in a small very deep lake in the Isle of Mull, September, 1854. I recognised the insect, as soon as I saw it in my net, from its smaller size, and frequent luteous lines along the elytra, as either *lapponicus* or *septentrionalis* of *Aubé*, and hence spent many hours in endeavouring to obtain a series of examples. The following extract from *Gyllenhal's* accurate description will sufficiently characterise the species: — “*Statura et summa affinitas præcedentis (marginalis) sed fere duplo minor et distinctus; elytrorum forma ut in priore, et jam supra nigra, margine late luteo; in disco præterea lineæ plurimæ longitudinales, in singulo elytro circiter 18, tenues obscure lutescentes, sæpe obsoletæ, quasi e paginâ inferiore translucetes.*” I have little doubt but that *D. septentrionalis* will prove a mere variety of *lapponicus*; the only difference being, according to *Aubé*, v. 65, that the female has the smooth form of elytra.

Gyrinus minutus, *Fab.* Not uncommon in a small lake near Loch Spelvie, Isle of Mull.

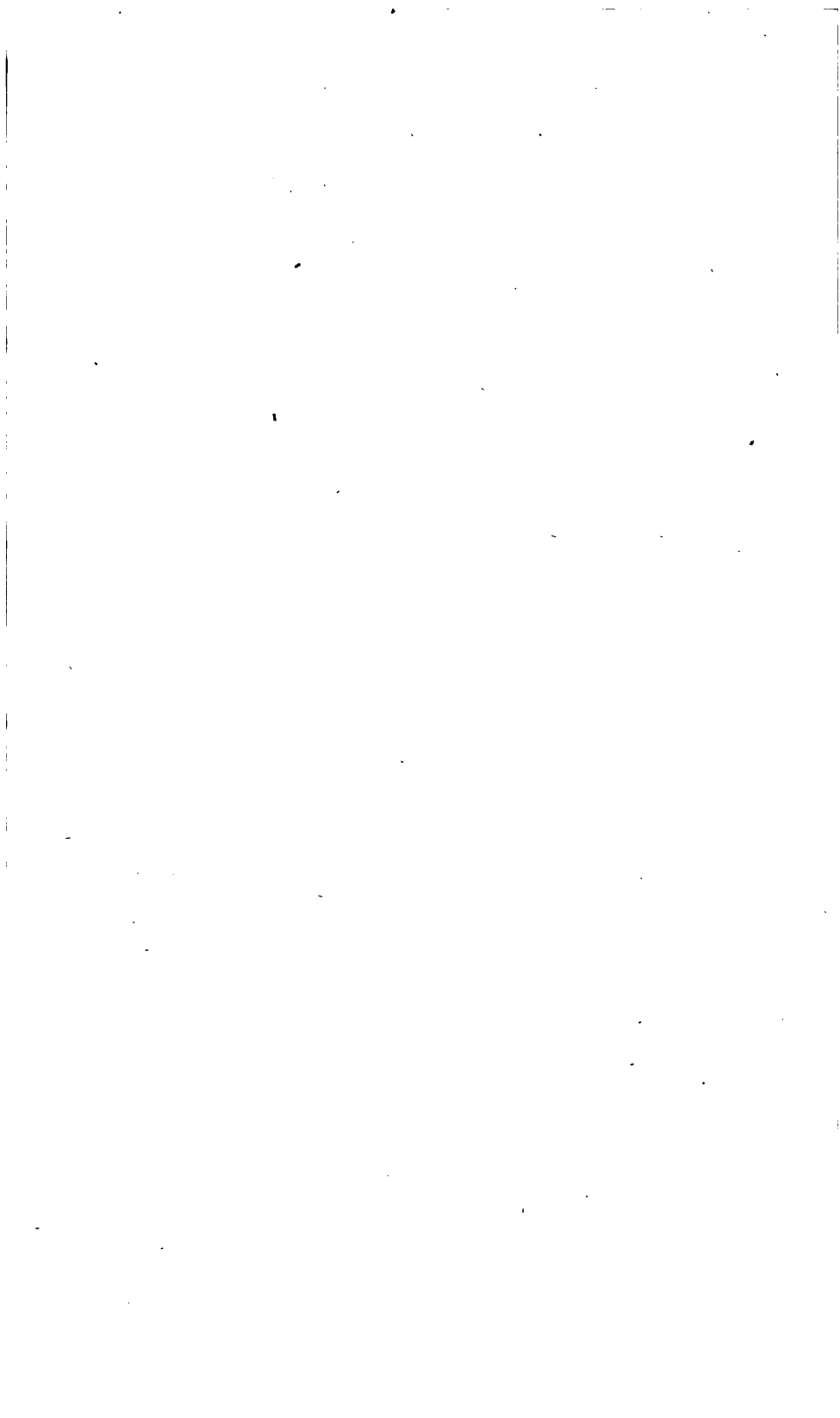
„ *bicolor*, *Payk.* In abundance at Southend and Sheerness.

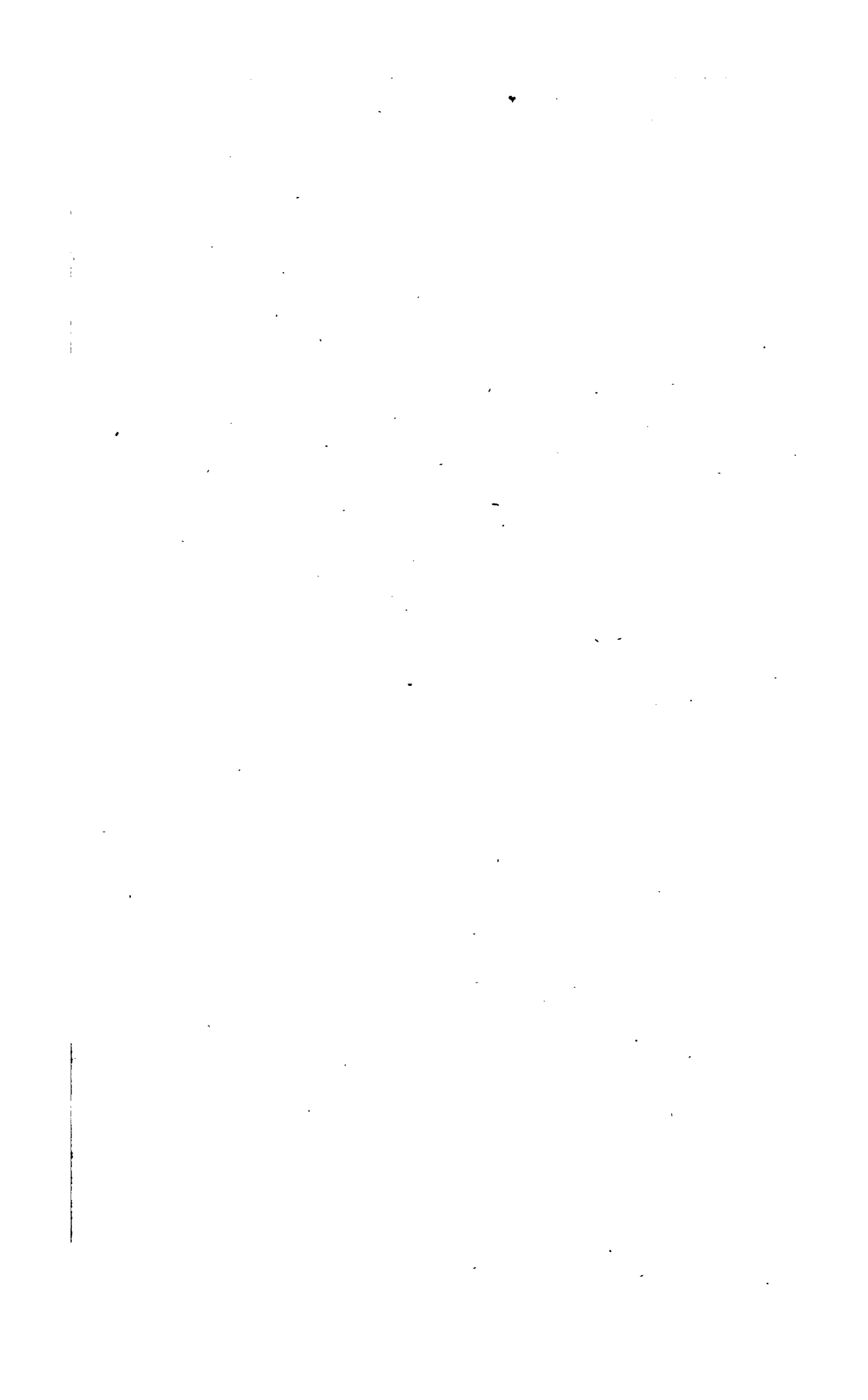
I should be very glad if any of your readers could communicate information respecting *H. Scalesianus*, *Steph.* *Stephens*, *Mandib.* ii. 57, mentions a pair taken by Mr. Scales in Norfolk, but unfortunately does not notice the month or the locality: has it ever been taken since? According to *Schaum* and *Aubé* it is extremely local on the Continent.

Hyd. unistriatus, *Illig.*, is also an insect of which we know little, though taken by collectors occasionally twenty years ago.

HAMLET CLARK.

Northampton, October 10, 1854.





1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the transparency and accountability of the organization. The text outlines the various methods used to collect and analyze data, ensuring that the information is reliable and up-to-date.

2. The second part of the document focuses on the implementation of the proposed changes. It details the steps involved in the process, from the initial planning stage to the final execution. The text highlights the challenges faced during the implementation and the strategies used to overcome them. It also discusses the role of the various departments in ensuring the successful completion of the project.

3. The third part of the document provides a detailed analysis of the results of the project. It compares the actual outcomes with the expected results, identifying the areas of success and the areas that need further improvement. The text also discusses the impact of the project on the organization's overall performance and the long-term benefits it has brought.

4. The fourth part of the document concludes the report by summarizing the key findings and providing recommendations for future actions. It emphasizes the importance of continuous monitoring and evaluation to ensure that the organization remains on track and achieves its goals. The text also expresses the confidence in the organization's ability to overcome any future challenges and achieve long-term success.

